

JPRS 71312

16 June 1978

TRANSLATIONS ON ENVIRONMENTAL QUALITY

No. 168

WORLD

WIDE

Reproduced From  
Best Available Copy

20000621 028

**DISTRIBUTION STATEMENT A**  
Approved for Public Release  
Distribution Unlimited

U. S. JOINT PUBLICATIONS RESEARCH SERVICE

REPRODUCED BY  
**NATIONAL TECHNICAL  
INFORMATION SERVICE**  
U. S. DEPARTMENT OF COMMERCE  
SPRINGFIELD, VA. 22161

#### NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

#### PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22151. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available through Bell & Howell, Old Mansfield Road, Wooster, Ohio, 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

<b>BIBLIOGRAPHIC DATA SHEET</b>		1. Report No. <b>JPRS 71312</b>	2.	3. Recipient's Accession No.
4. Title and Subtitle <b>TRANSLATIONS ON ENVIRONMENTAL QUALITY, No. 168</b>				5. Report Date <b>16 June 1978</b>
6.				
7. Author(s)				8. Performing Organization Rept. No.
9. Performing Organization Name and Address <b>Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201</b>				10. Project/Task/Work Unit No.
				11. Contract/Grant No.
12. Sponsoring Organization Name and Address  <b>As above</b>				13. Type of Report & Period Covered
				14.
15. Supplementary Notes				
16. Abstracts  <b>The serial report contains translations from the world press of articles and press commentary on environmental pollution and its effects and pollution control technology, organizations, and programs.</b>				
17. Key Words and Document Analysis. 17a. Descriptors <b>Worldwide Pollution Environmental Control Meteorology Ecology</b>				
17b. Identifiers/Open-Ended Terms				
17c. COSATI Field/Group 4, 6, 18G, 18H				
18. Availability Statement <b>Unlimited Availability Sold by NTIS Springfield, Virginia 22151</b>			19. Security Class (This Report) <b>UNCLASSIFIED</b>	21. No. of Pages <b>99</b>
			20. Security Class (This Page) <b>UNCLASSIFIED</b>	22. Price <b>PCA05</b>

JPRS 71312

16 June 1978

TRANSLATIONS ON ENVIRONMENTAL QUALITY

No. 168

JPRS 71312

16 June 1978

## TRANSLATIONS ON ENVIRONMENTAL QUALITY

No. 168

### CONTENTS

PAGE

#### WORLDWIDE AFFAIRS

Environmental Demands at Law of Sea Conference Discussed (NCNA, 10 May 78).....	1
UN Environment Program Council Meeting Opens in Nairobi (Various sources, 10, 11 May 78).....	3
Sixth Session of UNEP Wang Yueh-i Speech Bulgarian Delegate Addresses Meeting	

#### ASIA

##### PEOPLE'S REPUBLIC OF CHINA

Environmental Protection Progress Discussed in Interview (NCNA, 17 May 78).....	6
--	---

#### CANADA

Quebec City Ordered To Reduce Air Pollution (Paul Bennet; LE DEVOIR, 6 May 78).....	8
--	---

#### EASTERN EUROPE

##### BULGARIA

Government Ordinance Outlines Sanctions for Pollution Infractions (DURZHAVEN VESTNIK, 18 Apr 78).....	10
---	----

##### CZECHOSLOVAKIA

Environmental Research With Practical Applications Discussed (Vendelin Macho; PRAVDA, 12 Apr 78).....	18
---	----

## CONTENTS (Continued)

## Page

## EAST GERMANY

## Briefs

Ratification of Environment Convention 21

## ROMANIA

Civil Responsibility for Environmental Pollution  
(S. Lungu; REVISTA ROMANA DE DREPT, Mar 78)..... 22

## LATIN AMERICA

## BRAZIL

Environmental Protection Convention Submitted to Congress  
(Brasilia Domestic Service, 12 May 78)..... 31Antipollution Effort Lacking in Autonomy, Funding  
(O GLOBO, 14 May 78)..... 32SEMA Problems, Successes Since Inception, by  
Mateus Kacowicz  
Environmental Bills Submitted to Congress Since  
1974Impact of Pollution on Guanabara Bay Discussed  
(Arnaldo Cesar Jacob; MANCHETE, 20 May 78)..... 38Problems, Solutions to Pollution in Industrial Areas  
Studied  
(O GLOBO, 14 May 78)..... 42

## NEAR EAST AND NORTH AFRICA

## IRAQ

Sources of Air Pollution Analyzed  
(AL-JUMHURIYAH, 11 May 78)..... 50

## LEBANON

Marine Pollution Continues Unchecked  
(THE ARAB WORLD WEEKLY, 20 May 78)..... 52

## CONTENTS (Continued)

Page

## SUB-SAHARAN AFRICA

## IVORY COAST

Constant Decline in Annual Rainfall Noted  
 (Benita Ahossy; FRATERNITE-MATIN, 3-4 May 78)..... 57

## USSR

Supreme Soviet Bodies Approve Convention on Use of  
 Environment  
 (TASS, 12 May 78)..... 61

Enforcing Environmental Protection Laws  
 (N. Mikhno; SOTSIALISTICHESKAYA ZAKONNOST', Mar 78) .. 63

Environmental Protection in Moscow  
 (A. Biryukov; MOSKOVSKAYA PRAVDA, 7 Mar 78)..... 70

Environmental Protection Measures  
 (A. Tsygankov; EKONOMICHESKAYA GAZETA, May 78)..... 74

Minsk Official Outlines Pollution Control Program  
 (S. Lukashevich; IZVESTIYA, 19 Apr 78)..... 77

Lags in Implementing Air Pollution Controls  
 (M. Korf; EKONOMICHESKAYA GAZETA, May 78)..... 81

Faulty Air Pollution Control Equipment Hinders Kiev Program  
 (V. Skripnik; RABOCHAYA GAZETA, 28 Apr 78)..... 83

Pollution Causes Fishery Problems in Krasnoyarskiy Kray  
 (N. Utkin; PRAVDA, 14 Apr 78)..... 85

Conference: Power Ministry vs. Environment  
 (IZVESTIYA, 13 May 78)..... 88

Life Returning to Normal After Tadzhikistan Hurricane  
 (O. Latifi; PRAVDA, 29 May 78)..... 92

## WESTERN EUROPE

## INTERNATIONAL AFFAIRS

Danish-Swedish Straits Polluted by Swedish Chemical  
 Dumping  
 (Peter Kjelstrup; BERLINGSKE TIDENDE, 13 Apr 78)..... 94

CONTENTS (Continued)

Page

CYPRUS

Environmental Committee Holds Conference in Limassol  
(KHARAVGI, 18 Apr 78)..... 95

WEST GERMANY

Fish Reported Dying Out in Elbe River  
(FRANKFURTER RUNDSCHAU, 13 May 78)..... 97

WORLDWIDE AFFAIRS

ENVIRONMENTAL DEMANDS AT LAW OF SEA CONFERENCE DISCUSSED

OW101713Y Peking NCNA in English 1510 GMT 10 May 78 OW

[Text] Geneva, 9 May (HSINHUA)--Demands that coastal states reinforce their jurisdiction over the prevention of pollution from vessels for the preservation of the marine environment were voiced by delegates of many small and medium-sized countries at the meetings of the Third Committee of the Seventh Session of the Third UN Sea Law Conference. The delegates stressed that no countries may carry out marine scientific research in the exclusive economic zone and Continental Shelf of a coastal state without prior full authorization of the state concerned.

Informal discussions began on April 21 at the third committee over those articles of the "informal composite negotiating text" concerning the preservation of the marine environment and marine scientific research. During the discussions, delegates of many small and medium-sized countries pointed out that the relevant articles of the "informal composite negotiating text" restrict, to a certain extent, the right of a coastal state to exercise its full sovereignty and jurisdiction over its territorial sea and exclusive economic zone. They demanded revisions of these articles. However, on the pretext that these "would cause difficulties to international navigation", the Soviet delegate tried by various means to restrict or impair the right of a coastal state to exercise jurisdiction over the prevention of pollution in its territorial sea and exclusive economic zone. By so doing, he hoped to preserve the maritime hegemonic interests of the Soviet Union. This unreasonable stand of the Soviet Union had aroused dissatisfaction of many developing countries. The delegates of Tanzania, Egypt, Morocco, Madagascar, Somalia, Ghana, Trinidad and Tobago, Iceland, Spain, France and Canada pointed out that coastal states have the right to establish national laws and regulations for the prevention of marine pollution from vessels and the preservation of the marine environment so that they may impose penalties on foreign vessels for violations and undertake inspection of the vessels relating to the violations. They said that the superpowers would not hesitate to prejudice the sovereignty of other coastal states in order to protect their "freedom of navigation". The Moroccan delegate said that it is a matter of the sovereign right of a coastal state to decide on penalties to be imposed on foreign vessels for violations and that these violations should be dealt with in accordance with the laws and regulations of the coastal state concerned. The delegate of Spain pointed out that the coastal state has the sovereignty over straits within its territorial sea and therefore has the jurisdiction for the control and prevention of pollution in the straits.

In his speech the delegate of China supported the reasonable proposals of these countries. He pointed out that the territorial waters are under the sovereign jurisdiction of a state and that all activities of a foreign vessel within the territorial waters of a coastal state, including those relating to the prevention of pollution from vessels, should be subject to the jurisdiction of that coastal state.

---

If a foreign vessel should cause pollution to the marine environment in violation of regulations within the territorial sea of a coastal state, that vessel should naturally be subject to the laws and regulations of that coastal state. The coastal states have the right to deal with all violations seriously.

In the light of the fact that last March a 230,000-ton oil tanker caused grave pollution after an accident off the western coast of France, the French delegate proposed at the meeting that should a foreign vessel cause pollution or threat of pollution after an accident within the waters under the jurisdiction of a coastal state, that coastal state should have the right to take all compulsory measures. The proposal was supported by many countries including China. But it was opposed by the Soviet Union and some other countries. The Soviet delegate proposed that only when "there is grave and imminent threat of pollution" can the coastal states take extensive measures. This shed further light on the arrogance of the superpowers disregard of the rights and interests of the coastal states.

During the discussions of articles relating to marine scientific research, the U.S. delegate openly complained that the other coastal states imposed too many restrictions on such research. He demanded that "useless" restrictions be removed. He also tried to insert into the "text" those articles which a few countries had agreed upon in private negotiations at the previous session and which were favourable to their "freedom of scientific research". This unreasonable demand was refuted by the developing countries. The delegates of Tanzania and Yugoslavia declared that they would under no circumstances agree to the imposition of the will of a small number of countries on the majority of countries. The delegate of Egypt stressed that to undertake scientific research in waters under the jurisdiction of a coastal state must have the prior authorisation of that coastal state and that the coastal state has the right to reject any scientific research for non-peaceful purposes.

The Chinese delegate said that China consistently maintains that to carry out scientific research in the exclusive economic zone and Continental Shelf of a coastal state must have the authorization of that coastal state. Now a number of articles in the "text" relating to marine scientific research are unsatisfactory and they should be changed in conformity with the interests of the majority of developing countries.

CSO: 5000

WORLDWIDE AFFAIRS

UN ENVIRONMENT PROGRAM COUNCIL MEETING OPENS IN NAIROBI

Sixth Session of UNEP

Peking NCNA in English 1217 GMT 10 May 78 OW

[Text] Nairobi, 9 May (HSINHUA)--The sixth session of the Governing Council of the United Nations Environment Programme (UNEP) opened here this morning.

Attending the opening ceremony were representatives from 46 member states of the council and observers from 14 countries, as well as representatives from various UN bodies, intergovernmental and non-governmental organizations and national liberation movements.

China was represented by Wang Yueh-i, leader of the Chinese delegation and permanent representative to the UNEP Council, and Chu Ko-ping, leading member of the Environmental Protection Office under the State Council.

Mostafa Tolba, UNEP executive director, made explanatory remarks on the agenda and procedural arrangements of the session. He emphasized the need of practically incorporating the issue of environmental protection into the formulation of an international strategy and the struggle for the establishment of a new international economic order.

The current session, a regular annual session of the council, will review the current international environmental situation and programmes for environmental protection. It will also discuss problems relating to the question of correctly handling the relationship between environment and development.

Wang Yueh-i Speech

OW111838Y Peking NCNA in English 1551 GMT 11 May 78 OW

[Text] Gaborone, 10 May (HSINHUA)--Wang Yueh-i, head of the Chinese delegation at the sixth session of the United Nations Environment Programme (UNEP) Governing Council, pointed out in his speech that if the people of all countries are to protect the human environment, they must wage a resolute struggle against the rivalry between the super-powers for hegemony and their policies of aggression and war.

---

Wang Yueh-i said: "In addition to a review of the environmental action programme and making arrangements for this fiscal year's funds, the present session will focus attention on the eco-system, on environment and human health, and on potentially toxic chemicals. These are all problems related to the question of correctly handling the relationship between development and environment. Since the people of all countries and especially of the Third World are faced with the pressing task of developing their economies, it is a matter of vital importance to harmonize economic development with environmental improvement."

He noted: "Through their struggles, the developing countries have become more keenly aware that the old international economic order, based on oppression, exploitation and plunder, is a heavy yoke restraining the development of their national economies, and it is also the biggest obstacle to environmental improvement. Only by persevering in the effort to combat imperialism, colonialism and hegemonism and to break the old international economic order and establish a new one in its stead can they ensure their countries' independence and prosperity and create the necessary political and economic conditions for the improvement of the environment."

He said: "The superpowers continue to carry out aggression and expansion in all parts of the world, killing lives, destroying buildings and farmlands, and polluting the environment, all of which are highly detrimental to the people. Currently, the rivalry between the two superpowers for world hegemony has become more ruthless, and the danger of a new world war is growing."

Expressing in particular the superpower that styles itself a "natural ally" of the developing countries, Wang Yueh-i pointed out: That superpower "incessantly toots everywhere the line that development and environmental protection are dependent upon detente and disarmament. Yet, in actual practice, it devotes a massive effort to the arms race."

He said: "After winning political independence, the developing countries still have the task of achieving economic independence and developing their national economy. In the fulfillment of this task, they should pay attention to and earnestly study ways of ensuring harmony between development and environmental protection and improvement. We have seen from past experience that economic growth in developed countries was often accompanied by pollution and damage to the environment. The developing countries engaged in building a new life should avoid this beaten track. Experience in many countries show that environmental problems which accompany economic development can be coped with satisfactorily if we have at heart the interests of the people and the long-term interests of the country and take appropriate preventive measures simultaneously with development."

The head of the Chinese delegation said: "The declaration and programme of action on the establishment of a new international economic order adopted by the general assembly at its sixth special session put forward a number of basic principles and policy measures for the establishment of a new international economic order, and provided that all agencies within the United Nations system should carry out this programme of action. In this regard, the United Nations Environment Programme should adhere to these basic principles and help to speed up the development of the national economy and greatly improve the environment of the developing countries."

Bulgarian Delegate Addresses Meeting

AU111103Y Sofia Domestic Service in Bulgarian 0530 GMT 11 May 78 AU

[Text] The sixth session of the governing council of the UN environment protection program opened in the capital of Kenya. The session elected a leading bureau: Miqual Angel (Belarda), the Spanish delegate, was elected chairman of the bureau. Zhivko Zhivkov, leader of the Bulgarian delegation, was elected as his deputy.

In his statement Zhivko Zhivkov declared that the worldwide ecological situation is a cause for serious concern. He stressed that a great amount of international cooperation is necessary in the sector of environmental protection. The Bulgarian delegate stated that the People's Republic of Bulgaria fully supports the Soviet proposal to convene a high-level European conference on questions of environmental protection.

CSO: 5000

PEOPLE'S REPUBLIC OF CHINA

ENVIRONMENTAL PROTECTION PROGRESS DISCUSSED IN INTERVIEW

OW170927Y Peking NCNA in English 0748 GMT 17 May 78 OW

[Text] Peking, 17 May (HSINHUA)--In a recent interview with HSINHUA a leading member at the Office for Environmental Protection, which is run within the State Council, answered questions about the work and problems of environmental protection in China. He was also asked about policies and measures being implemented by the office.

Q. What is the state of environmental protection in China?

A. Chairman Mao, Premier Chou En-lai and Chairman Hua Kuo-feng have paid great attention to environmental protection. Much has been done to improve and protect environmental conditions, over the past 28 years since the founding of new China. Older cities have been transformed, conditions in workers' living quarters and in public health conditions have been improved. There is better distribution of industry. Small enterprises have merged with bigger ones, which have been moved to new industrial districts where multipurpose use is made of wastes.

Soon after the convocation of the first meeting on environmental protection held by the State Council in 1973, protection groups were set up in all provinces, municipalities and autonomous regions and departments under the State Council. They have carried out a general survey of air and water pollution in China and adopted effective control measures.

New techniques and technological processes have been introduced to check pollution. They include apparatus that no longer requires the use of mercury, non-cyanide electroplating, enzyme processes (removing hair from hides through use of enzymes), ammonia base sulphite pulping, and the re-use of treated waste water at oilfields. In addition some factories have developed advanced techniques for the disposal of waste water, gas and slag.

Q. How bad is environmental pollution in China?

A. Environmental protection was seriously disrupted by the sabotage of the gang of four. Pollution in some cities and contamination of rivers, lakes and seas, in soils and in the working environment has not yet been controlled. It is rather serious in some localities and industries. Density of dust and sulphur dioxide has gone beyond the limits set by the state. Major waterways such as the Yangtze, the Yellow, the Huai and the Pearl, have been seriously contaminated in sections running through industrial cities, because untreated industrial waste liquids are discharged into them directly or indirectly. Contamination of Pohai, China's biggest inland sea, is becoming serious.

The amount of industrial waste is estimated at 200 million tons every year. Most of the waste is not utilized, and takes up space and pollutes the environment.

Noise pollution in many cities, particularly in mining or industrial areas, is also very serious.

---

With industrial development, environmental pollution is now given even greater attention.

Q. What further measures are you going to take to protect the environment?

A. A mass movement is needed to speed up pollution control.

The anti-pollution projects will be put into the state plan so as to tackle industrial pollution in stages and according to the order of importance and urgency. The funds and materials needed will be guaranteed. Industries causing pollution must take realistic measures to solve them and meet environmental standards set.

Industries that are new or involved in building projects should design, and put into operation pollution control systems at the same time as building the main project. Otherwise they will not be allowed to build or operate. There needs to be careful checking and supervision that these regulations are met.

Work on the law and regulations for environmental protection will be completed soon.

We shall step up research on the environment and on techniques of controlling pollution. Particularly important are the finding of new techniques, multipurpose utilization, all-round prevention and control, environmental analysis, as well as the development of monitoring skills and the mastering of basic theories of environmental science.

State policy is to encourage industry to turn industrial wastes into useful things. However, it is often the case that a single industry or unit cannot manage multipurpose utilization. Joint or cooperative efforts are sometimes required.

The work of environmental protection is new to us. We have to publicize its importance on a grand scale and by making clear its significance to everyone, inspire the masses to greater efforts to fight pollution.

CSO: 5000

CANADA

QUEBEC CITY ORDERED TO REDUCE AIR POLLUTION

Montreal LE DEVOIR in French 6 May 78 p 8

[Article by Paul Bennet]

[Text] Quebec--The Urban Community of Quebec (CUQ) has until 31 December to conform to an ordinance of the Quebec Ministry of the Environment directing it to reduce to an acceptable level the pollution caused by the incinerator at Limoilou.

According to the text of the ordinance, the emission of partially burned paper particles coming from the incinerator exceeds the standards decreed by the ministry by from three to ten times, according to the method of evaluation employed.

Although the ordinance was issued last Wednesday, it was only yesterday that LE DEVOIR was able to confirm it through a spokesman from the Ministry for the Environment, Marcel Leger. On Thursday, during the meeting of the Council of the Urban Community, the mayors of 13 member municipalities of the CUQ voted a new sum of \$150,000 intended for carrying out some emergency measures at the incinerator; however, they avoided any mention of the ordinance.

On 21 March, in a letter addressed to the president of the CUQ Marcel Pageau, Mr Leger announced his intention of proceeding via the ordinance to force the Council of the Urban Community to arrive at a rapid solution to a situation which, in his opinion, had become "intolerable."

In his letter, the minister emphasized that the Department of Environmental Protection had established that the emissions of particles coming from the incinerator exceed by more than seven times the standards of the ministry and that, far from improving the situation had deteriorated during recent months.

The minister's initiative angered Mr Pageau, newly elected to the post of president of the executive branch of the CUQ, who criticized the minister for

"not allowing him an opportunity to get his feet wet." In a rather scathing tone, Mr Pageau replied to the minister that "the threat of proceeding by ministerial ordinance... is not of a nature to encourage municipal administrators who, he maintains, have given priority to doing everything possible to settle the pollution problem."

Mr Pageau emphasized that expenditures of \$26 million have already been invested in this community installation, but that in spite of all efforts, the problem of the emission of partially burned paper particles was still far from being solved. In fact, this problem, which all of the engineering firms have until now been powerless to solve, has been a serious one since the opening of the incinerator in 1974.

Mr Pageau also took advantage of the opportunity to let fly another arrow at the Quebec government by remarking that the incinerator had been financed entirely by the taxpayers of the municipalities which form the CUQ and that the only support received from higher echelons of government came from the federal government which had exempted the CUQ from paying the sales tax on the purchase of the machinery and equipment.

In any case, on Thursday, the mayors of the Urban Community unanimously adopted the recommendations of the chief engineer of the CUQ, Herve Aubin, who had drawn up a list of works to be undertaken immediately, requiring expenditures of from \$120,000 to \$150,000.

9174  
CSO: 5000

BULGARIA

GOVERNMENT ORDINANCE OUTLINES SANCTIONS FOR POLLUTION INFRACTIONS

Sofia DURZHAVEN VESTNIK in Bulgarian 18 Apr 78 pp 372-375

[Ordinance on Property Penalties for the Pollution of the Air, Water, and Soil (Passed with Council of Ministers Decree No 7 of 14 March 1978) ]

[Text] Chapter I

General Stipulations

Article 1. Economic organizations and their branches which release in the air, water, and soil harmful substances and pollutants in quantities exceeding admissible norms shall be subjected to property penalties in accordance with this ordinance.

Article 2. The penalties and their duration shall be determined by order of the chairman of the Committee for the Protection of the Environment of the Council of Ministers or his official representatives.

Article 3. The imposition of penalties shall not relieve the economic organizations or their branches from the obligation to compensate for the damages caused through the pollution of the air, water, and soil of other organizations or individuals; it shall not release from penal or, respectively, administrative-penal liability leading officials who have allowed the pollution of the environment.

Article 4. (1) The order on imposed penalties and records of the results of the analyses shall be sent to the economic organizations or their branches.

(2) On the basis of the order the penalized economic organization or branch shall transfer the amount of the fine to the non-budget account of the Committee for the Protection of the Environment before the 10th of the following month.

(3) The amounts of the fines paid by the economic organizations or their branches shall not be included (computed) in the cost of their output and shall be reported as "other losses."

(4) Should the branch or economic organization operate at a loss or lack adequate funds with which to pay the fine, the superior organization shall pay the balance.

Article 5. (1) The fines shall be collected within one month from the day in which the rayon environmental protection inspectorate has established the pollution. The samples used for determining the pollution shall be taken by the rayon environmental protection inspectorate in the presence of a representative of the economic organization or its branch.

(2) Samples shall be taken and analyzed in accordance with the corresponding Bulgarian state standard. In the case of harmful substances or pollutants for whose analysis no established standards exists the methods recommended by the organs of CEMA, as stipulated by the chairman of the Committee for the Protection of the Environment, shall be used.

Article 6. The economic organizations or their branches which eliminate or reduce the pollution shall file a request to the corresponding rayon environmental protection inspectorate, requesting the cancellation or reduction of the fines. On the basis of the results of the new samples the fines may be cancelled or reduced as of the day the request was submitted. The funds paid in such cases after the day the claim was filed shall be refunded.

Article 7. Economic organizations or their branches which neither stop nor reduce pollution shall have their fines increased by 10 percent after 30 days starting with the day of the imposition of the fine, and 20 percent after 60 days.

Article 8. (1) Fined economic organizations or their branches may appeal the fines to the Council of Ministers within 30 days following the imposition of the fine, through the respective ministry or another department.

(2) The appeal shall be submitted to the Council of Ministers with a report by the head of the respective ministry or other department substantiating the considerations of the illegality of the imposed penalty.

(3) The appeal shall be considered and resolved within one month by the deputy chairman of the Council of Ministers in charge of coordinating the control activities of ministries and other departments or, on his suggestion, by the Council of Ministers.

(4) The appeal shall not prevent the collection of the fine.

## Chapter II

### Determining Amounts of Fines

#### Section I

##### Determining Fines for the Pollution of Water Currents and Basins

Article 9. (1) Economic organizations and their branches which pollute water currents and basins in excess of admissible norms, as stipulated in ordinance No 68 on the pollution of surface waters (DV, No 6, 1976) shall be subjected to material penalties consistent with the released quantities of harmful substances and pollutants.

(2) Harmful substances and pollutants subject to fines and the sizes of the fines are indicated in the table--Appendix No 1.

(3) The fines as per the preceding paragraph shall be determined as follows:

1. When waste water is released in a water reservoir whose waters have been polluted above the admissible norms for a specific category--according to the formula of Appendix No 2;

2. When waste water is released in a water reservoir whose waters at discharge point correspond to the admissible norms for the stipulated category--according to the formula of Appendix No 3;

3. When waste water is released in the sewer system of a settlement--according to the formula Appendix No 4.

Article 10. The overall size of the fine paid by the economic organization or its branches shall be the sum total of the fines computed separately for each pollutant as indicated in Table--Appendix No 1.

## Section II

### Determining Fines for the Pollution of the Air

Article 11. (1) Economic organizations and their branches which release in the air pollutants in excess of the norms stipulated in ordinance No 1 for norms of the admissible content of harmful substances in the gases released in the atmosphere (DV, No 18, 1978) shall be fined in accordance with the released quantities of pollutants.

(2) The harmful substances and pollutants subject to fines and the amounts of the fines are indicated in Table--Appendix No 5.

(3) The fines stipulated in the preceding paragraph shall be computed according to the formula of Appendix No 6.

Article 12. The overall amount of the fine paid by an economic organization or its branches shall be the sum total of the fines computed separately for each pollutant as indicated in Table--Appendix 5.

## Chapter III

### Collection and Utilization of the Fines

Article 13. Economic organizations or their branches shall pay the fines to the non-budget account of the Committee for the Protection of the Environment.

Article 14. (1) The fines shall be used on the basis of an income-expenditure account drawn up as per article 38 of the Law on the Formulation and Execution of the state budget (IZV., No 91, 1960; amended DV, No 99, 1973).

(2) The income part of the account shall include:

1. Cash on 1 January, consistent with the surplus determined on 31 December of the preceding year;
2. The funds collected from fines imposed on economic organizations or their branches in the current year;
3. Other income.

(3) The expenditures part of the account shall include expenditures for the following:

1. Financing the application of scientific research and technical achievements related to environmental protection;
2. Financing scientific research for the development of wasteless technology;
3. Presentation of specific and individual awards for reducing the pollution of water currents and basins and the air considerably below admissible norms, and designing and manufacturing treatment systems with indicators exceeding world standards, in accordance with the stipulations of decree No 5 of the BCP Central Committee, the Council of Ministers, and Central Council of Bulgarian Trade Unions of 1 February 1977 on improving the organization of wages (DV, No 19, 1977);
4. Providing services of a scientific or technical nature (consultations, reviews, expert evaluations, and others);
5. Sponsoring scientific and technical conferences, symposiums, and exhibits related to environmental protection;
6. Implementation of particularly important tasks assigned by the chairman of the committee for the protection of the environment to individual highly skilled scientific workers, specialists, and production workers;

7. Refunding of funds paid in advance by the economic organizations and their organizations as per article 6.

(4) The overall amount of bonuses as per .3 of the preceding paragraph may not exceed 20 percent of the expenditures part of the account; the one time bonus to the collective of an individual economic organization or branch may not exceed 1,000 leva.

#### Additional Stipulations

#1. Economic organizations or their branches shall be relieved from the payment of fines for the time in the course of which individual production facilities or technological lines causing pollution have been stopped for capital repairs, providing that the duration of the repair is in excess of ten days and that no less than three days prior to its beginning the respective rayon environmental protection inspectorate has been informed in writing.

#2. Fines as per the present ordinance shall not be imposed on economic organizations and their branches for production capacities installed as per article 24 of the Law on the Protection of the Air, Water, and Soil from pollution.

#3. Harmful substances and pollutants and the size of the fines which may be imposed to economic organizations and their branches for the pollution of the soil shall be determined by the Council of Ministers following the ratification of the maximally admissible pollution norms.

#### Concluding Stipulations

#4. The present ordinance is issued on the basis of article 18 of the Law on the Protection of the Air, Water, and Soil from Pollution (published in DV, No 84, 1963; amended, No 26, 1968; No 29, 1969; No 95, 1975; No 3, 1977; supplemented, No 1, 1978).

#5. With the approval of the minister of finance and the chairman of the Bulgarian National Bank, the chairman of the Committee for the Protection of the Environment shall issue instructions on the solution of problems related to the application of the present ordinance.

Appendix No 1 to Article 9, Paragraph 2

Table of Harmful Substances and Water Pollutants and the Amount of Fines

Number	Description	Fine in Leva-Kilogram
1.	Oxydation (perman-ganate)	from 0.012 to 0.12
2.	Undissolved substances	from 0.005 to 0.05
3.	Chromium (hexavalent)	from 0.41 to 4.10
4.	Chromium (trivalent)	from 0.05 to 0.50
5.	Cyanides	from 2.50 to 25.00
6.	Phenols	from 0.13 to 1.30
7.	Manganese	from 0.075 to 0.75
8.	Iron	from 0.02 to 0.20
9.	Copper	from 0.25 to 2.50
10.	Zinc	from 0.42 to 4.20
11.	Cadmium	from 0.42 to 4.20
12.	Lead	from 0.42 to 4.20
13.	Hydrogen sulfide (free)	from 0.42 to 4.20
14.	Detergents	from 0.21 to 2.10

Appendix No 1 to Article 9, Paragraph 3

The fine as per article 9, paragraph 3, .1, shall be computed according to the following formula:

$$A = 0 (Kf - Kn) T \times S \times 3.6 \times 10^{-3}$$

In which:

A is the amount of the fine in leva for the corresponding polluter for one month;

0 is the quantity of waste water in liters per second;

Kf is the concentration of the pollutant in the waste waters in milligrams per liter;

Kn is the maximally admissible concentration of the pollutant for the respective category of the water body in milligrams per liter;

T is the time in hours for one month in the course of which waste water has been released in the water body;

S is the amount of fine for the corresponding pollutant in leva per kilogram established by the penalizing organ within the limits indicated in Appendix No 1.

Appendix No 3 to Article 9, Paragraph 3

The fine as per article 9, paragraph 3, .2, shall be computed according to the formula:

$$A = \frac{0 \times Kf}{K} (K - Kn) T \times S \times 3.6 \times 10^{-3}$$

In which:

K is the concentration of the polluting substance in the waters of the water body in milligrams per liter following the addition of waste water.

The remaining symbols are the same as in Appendix No 2.

Appendix No 4 to Article 9, Paragraph 3

The fine as per article 9, paragraph 3, .3, shall be computed according to the following formula:

$$A = 0 (Kf - Knk) T \times S \times 3.6 \times 10^{-3}$$

In which:

Knk is the maximally admissible concentration of the pollutant for the sewage network in milligrams per liter.

The remaining symbols are the same as those of Appendix No 2.

Appendix No 5 to Article 9, Paragraph 3

Table on Harmful Substances and Pollutants of the Air and the Amount of Fines

Number	Description	Fine in Leva-Kilogram
1.	Sulfur Dioxide	from 0.003 to 0.03
2.	Dust	from 0.001 to 0.01
3.	Lead	from 0.21 to 2.1
4.	Arsenic	from 0.05 to 0.5
5.	Hydrogen Sulfide	from 0.019 to 0.19
6.	Nitrogen Oxide (computed in terms of nitrogen dioxide)	from 0.02 to 0.2

Temporarily, fines based on indicators one and six shall not be imposed on thermoelectric power plants and combustion installations.

Appendix No 6 to Article 11, Paragraph 3

The fines as per article 11, paragraph 3, shall be computed according to the following formula:

$$A = G (Kf - Kn) \times T \times C \times 3.6$$

In which:

A is the amount of the fine in leva for the respective pollutant for one month;

G is the amount of gases released in the atmosphere in cubic meters per second;

Kf is the concentration of the pollutant in waste gases in grams per cubic meter;

Kn is the maximally admissible concentration of the pollutant in waste gases in grams per cubic meter;

T is the time in hours for one month in the course of which waste gases have been released in the air;

S is the amount of the fine for the respective pollutant in leva/kilograms stipulated by the penalizing organ within the limits of Appendix No 5.

5003  
CSO: 5000

---

CZECHOSLOVAKIA

ENVIRONMENTAL RESEARCH WITH PRACTICAL APPLICATIONS DISCUSSED

Bratislava PRAVDA in Slovak 12 Apr 78 p 6

[Article by Engr Vendelin Macho, Dr Sc, Klement Gottwald state prize laureate, of Research Institute for Petrochemistry, Novaky: "Environmental Protection Research and Its Application in Practice"]

[Text] The problems of environmental protection are as well-known as is the fact that our supreme party and state organs pay constant attention to them. This is borne out by the long, medium and short term plans providing for considerable investments which will help eliminate or at least reduce the harmful effect of individual branches, industrial plants and equipment on the living environment. Among these investment projects are plants for waste water treatment and other measures for increasing water protection, facilities for the elimination, or at least reduction, of gaseous emissions, of liquid and solid waste, measures for substantial improvement of air purity and working environment in plants with gases and fumes harmful to health.

The chemical industry is one of those branches in which measures for environmental protection are extraordinarily urgent. The workers at Slovchemia the chemical industry enterprises trust and its general directorate in Bratislava realize this also. This is evident both from already enacted measures, results and future plans, and the solution of these problems by the research institutes and other scientific research centers. The research institutes of Slovchemia observe the principle that proposed new technologies and new productions, when applied in practice, must not--and if this is inevitable, only in a minimum degree--generate solid, liquid or gaseous waste--in other words, they must not pollute the living environment. We therefore search for the methods of high selectivity of syntheses, technologies and processes which will result in the manufacture of desired products only. If this is impossible--either because of operation of objective natural laws or for technical-economic reasons--we explore the possibilities of utilization of waste so that it becomes the most valuable byproduct. Only in those instances where we do not find any possibility

of its utilization, do we dispose of waste, and then in such a way as not to pollute environment. Moreover, several research projects include the study of problems arising in existing production plants. Among them, for example, is the problem of emissions in the plants producing vinyl chloride and polyvinyl chloride, of carbon disulfide and hydrogen sulfide emissions in the factories producing viscose rayon, fabrics and so on.

#### "Syrups" Instead of Molasses

The Research Institute of Petrochemistry at Novaky has studied and solved several interesting problems in this area in recent years. In close co-operation with Slovnaft national enterprise in Bratislava, we have partly solved the problem of utilizing the waste byproduct from plastics production and at the same time achieved the top quality of color polyethylene granules of braLEN [translation unknown] of 200, 400 and 600 series. In cooperation with Chemko national enterprise at Strazske and other partners, we have worked out and actually set up continuous production of pentaerythritol and calcium formate. Byproducts which could not be utilized and therefore represented waste were so-called "syrups." They essentially consist of the water solution of products of condensing and autocondensing reactions of formaldehyde and acetyldehyde and residues of unisolated pentaerythritol and calcium formate. Naturally, the solution of such problems lies primarily in the substantial increase in the selectivity of formation of the main product, but the formation of byproducts cannot always be prevented. As a result, the "syrups" could not be released into the waste water and their disposal by burning caused considerable problems and difficulties. For this reason, after toxicological tests on guinea pigs and preliminary application experiments in the nutrition of pigs and cattle carried out in cooperation with the Department of Nutrition and Feeding of Domestic Animals of the Agricultural College in Brno, we proposed using the "syrups" for feeding domestic animals, primarily ruminants. It was discovered that when they were added as a substitute for 5-percent fodder sugar to the complete granulated fodder for cattle, the utilization of fibrous material increased by 12 percent in comparison with the control tests. Successful also was the addition of 2-5 percent of "syrup" to the complete fodder compound for poultry fattening (broilers). Experimental groups registered favorable increases in live weight, while fodder consumption per unit of increase declined slightly.

As the results of experiments carried out by Prof MD Jan Lazar and his fellow workers at the Veterinary College in Kosice revealed, the utilization of "syrups" from production of pentaerythritol instead of molasses which is in short supply is particularly effective for the granulation of complete fodder allowances. The granulation of fodder as the progressive method thus makes possible not only the utilization of waste "syrups" which equal molasses produced during the refining of sugar, but also greater utilization of straw and other ballast materials which would not be used almost at all without granulation. The waste "syrups" thus replace sugar

refinery molasses which is in short supply. In addition, their economic utilization virtually eliminated waste from production of pentaerythritol. This production process no longer pollutes our living environment and, in addition, supplies valuable products to chemical and consumer industries and farmers.

#### Improved Resins

Among the problems faced by the plants producing formaldehyde and processing it into resins or other products of organic synthesis is the elimination of formaldehyde fumes from the air and waste water. We have succeeded in essentially solving this problem while producing valuable products at the same time. Much more complex, however, was the problem of free and released formaldehyde in the urea-formaldehyde resins produced in large quantities. The free formaldehyde in the urea-formaldehyde resins reaching the value of 0.8-1.0 percent of specific weight is especially unpleasant because of its offensive odor. This is true of the production of resins, their handling and their use as adhesives in the woodworking industry and other branches. Due to the high content of free formaldehyde in resins, the working environment became unbearable and by its harmful effect jeopardized also the application of urea-formaldehyde adhesives. Consumers and users of furniture, cottages and other products of the woodworking industry in which such urea-formaldehyde resins were used as adhesives were sometimes "annoyed" by the formaldehyde released for a relatively long time. It polluted the living environment in apartments, wooden cottages, warehouses and so on. The quantity of released formaldehyde contained as much as 3.1-5.0 mg/g of resin. In cooperation with Chemko national enterprise at Strazske and State Wood Research Institute in Bratislava, however, we have succeeded in solving both problems without impairing the strength and other useful properties of urea-formaldehyde resins.

#### Regeneration Resulted in Savings

In cooperation with Slovnaft national enterprise which has a very positive attitude toward problems of environmental protection, we have solved the problem of and practically carried out in this enterprise the regeneration of waste antifreeze coolants from combustion engines and other equipment on the basis of toxic ethylene glycol and other multivalent alcohols. For the time being, we regenerate the used antifreeze coolants only from some big customers, but even this quantity represents savings of some hundreds of thousands of korunas per year. Thus we not only protect our environment, and particularly water, from pollution, but also save a valuable product of the chemical industry.

We have already solved or are working on the solution of other problems of environmental protection. We are investigating, for example, how to utilize often waste and bad-smelling hydrogen sulfide and mercaptans for production of mercaptans and dialkyl sulfides with lower vapor tension either by catalyzed addition to olefins, particularly isobutylene, or in another way. These can be more easily separated and stored than the initial gaseous hydrogen sulfide and mercaptans with a low boiling point.

---

EAST GERMANY

BRIEFS

RATIFICATION OF ENVIRONMENT CONVENTION--UNO, New York, ADN correspondent-- Peter Florin, permanent GDR representative at the United Nations, today delivered to the UN secretary general in New York the GDR's instrument of ratification for the convention banning the military uses and other hostile uses of materials for the purpose of affecting the environment. The convention was ratified by the GDR State Council on 17 May. The number of ratifications has thus been increased to 12. The convention will come into force when 20 states have delivered their documents of ratification. Ambassador Dr Gerhard Herder, who participated as GDR representative in the negotiations on the environment convention, told ADN: "The significance of this convention is chiefly that it precludes the abuse of the latest achievements of science and technology to change the environment and climate for military and other hostile purposes, and in that it thus bans the extension of the arms race to a new and unconventional sphere of warfare." [Text] [East Berlin ADN International Service in German 1705 GMT 25 May 78 LD]

CSO: 5000

ROMANIA

CIVIL RESPONSIBILITY FOR ENVIRONMENTAL POLLUTION

Bucharest REVISTA ROMANA DE DREPT in Romanian Mar 78 pp 24-28

[Article by S. Lungu, department president, Bacau County Court]

[Text] The RCP Program for Building a Multilaterally Developed Socialist Society and Advancing Romania Toward Communism, states that for the protection of the environment "the party will promote a consistent policy to prevent the pollution of nature, and to strictly apply the legal provisions regarding the unaltered conservation of the environment"; one of the actions that will be taken to this end will be "the instruction and education of all the citizens of the country, aimed at their active participation in fulfilling the party and state policy for environmental protection." (1)

The concern for the population's health through protection of the environment is also reflected in the Directives of the 11th Party Congress, concerning the 1976-1980 Five-Year Plan and the guidelines for Romania's socioeconomic development for the 1981-1990 period, which provide for "the strict application, in a comprehensive manner, of measures to protect the environment and to conserve the natural beauty of the nation, as an important national heritage." (2)

In order to heighten the responsibility of all citizens in the broad action of environmental protection, the Code of Principles and Work Standards in Communists' Lives, and of Socialist Ethics and Justice, establishes that one guideline for the behavior of all party members and all citizens is the obligation to exhibit particular concern for the proper management of the land, water, and forests, and to actively participate in their protection. (3)

At the same time, Romania participates actively and contributes to the international cooperation for environmental protection which is being carried out by the UN in Europe in accordance with the Final Act of the Conference for Security and Cooperation in Europe (4), as well as bilaterally by CEMA with neighboring and other nations.

As part of these political circumstances and international agreements, our nation has formulated a number of regulatory acts intended to assure the

protection of the environment and to establish the responsibility of those who violate the legal provisions in this domain.

Thus, in addition or alongside responsibilities of another nature, some laws contain express stipulations about civil responsibility for violating legal provisions regarding environmental protection.

In such cases, civil responsibility is instituted by Article 73 of Law No 9/1973 regarding environmental protection, Article 56 of the Water Law (Law No 8/1974), Article 39 of the Veterinary Health Law (Law No 60/1974), Article 39 of Law No 61/1974 regarding activities in the nuclear domain in Romania, and Article 68 of Law No 59/1974 regarding land resources.

It is interesting to note that only Law No 61/1974 regarding activities in the nuclear domain in Romania, regulates the nature of civil responsibility, the maximum amount of reparations, as well the statute of limitations on the right to take action for compensation of losses caused by a nuclear accident, while the other laws mentioned above simply refer to civil responsibility in general; under these circumstances, therefore, recourse will have to be had to the classic principles of civil responsibility when the responsibility is the result of a failure to respect the legal provisions regarding environmental protection.

In what follows, we propose to analyze the operation of civil responsibility for losses caused by a failure to respect legal provisions regarding the environment.

Before attempting to answer the question of whether this is a matter of objective or culpable civil responsibility, we believe it is necessary to examine the obligations incurred by socialist units, their managements, and all employed persons.

For instance, Chapter III of Law No 9/1973 regarding environmental protection, determines the tasks of central and local organs of the state administration, and of cooperative and other public organizations, whose affiliate economic and social units conduct activities that can harm the environment. In this respect, the law determines that in addition to the technical measures designed to protect the environment, it is also compulsory to take steps so that the personnel of these units will become aware and knowledgeable about environmental protection in connection with the activities which they perform. Article 44 of the law specifically stipulates the direct responsibility of the managements of ministries and other central organs of the state administration, of cooperatives and other public organizations, and of socialist organizations, as well as of the executive committees of peoples' councils, whose subordinate units conduct socioeconomic activities, for respecting the legal provisions regarding the conservation, utilization, and regeneration of natural resources, for equipping these units with installations to trap and neutralize pollutants, and for ensuring the respect of all other legal provisions regarding the protection of the environment.

As another instance, Article 11 of Law No 11/1971 regarding the organization and management of state socialist units, stipulates the obligation of the latter to assure the application of measures for preventing and combatting environmental pollution.

We are therefore in the presence of express legal provisions which institute precise obligations and responsibilities for the managements of socialist units, aimed at preventing and combatting environmental pollution. The disregard of these job obligations, their violation resulting in the creation of damages, can only generate culpable responsibility since they then become purely and simply a matter of violation of job responsibilities.

As far as we know, the question of the nature of civil responsibility in the case of damages caused by environmental pollution has not yet been treated in Romania's judicial literature. A proposal de lege ferenda in this domain has been made in the sense of regulating responsibility on the basis of the principle of objective responsibility. (5)

As to the application of objective responsibility to the topic at hand, we have already indicated that our state has legislated this responsibility only for the case of nuclear damages. Consequently, in accordance with Article 33 of Law No 61/1974 regarding nuclear activities in Romania, the holder of an authorization is exclusively responsible, independently of his guilt (and we underline this point), for damages caused by a nuclear accident resulting in death, bodily harm, or impairment of health, or in the destruction, devaluation, or incapacitation of goods.

The foundation of this responsibility without guilt is naturally found in the statement of motives of this law, where it is shown that the pursuit of activities in the nuclear domain implies, by the nature of these activities, certain risks associated with the possibility of irradiation or contamination with radioactive substances. Because these risks are totally unusual, insofar as nuclear energy seems to be a "superhuman" force which can escape human control and once unleashed, can exceed its established limits (6), we believe that this regulation is an obvious one.

But in the case of polluting installations, however, the possibility of such risks can and must be removed by strictly respecting the legal provisions designed to prevent and combat environmental pollution.

In fact, our state assures that such risks are avoided by providing additional budget allocations at the time of construction of industrial installations that could present pollution potentials. For instance, a special additional investment was made during the construction of the Chemical Fertilizer Combine of Bacau, to provide installations for purifying the water resulting from catalysis and the released gases, so as to totally eliminate air and water pollution.

Similarly, significant funds have been allocated to existing industrial plants for the construction of anti-pollution installations.

The result of all this is that objective conditions are created that will guarantee the fulfillment of our party and state policy for environmental protection.

Nevertheless, material losses are still caused by a failure to respect legal provisions designed to prevent "polluting accidents" and their consequent "ecological damages." (7)

Referee organs and judicial courts have in fact had occasion to settle cases of this nature.

An examination of the decisions refereed in this domain leads to interesting conclusions regarding the foundations of civil responsibility used to define the obligation for compensation.

In this respect, the First State Referee, in Decision No 1960 of 21 August 1972 (8), examining a request for rearbitration of the litigation settled by Decision No 821/1972 pronounced by the Central State Referee, concluded that the loss is due to the the guilt of the accused (and we underline this point), reasoning that "the causal relation between deed and prejudice is evident, and since the preservation of water purity is a legal obligation for all physical and legal persons, the Referee was justified to invoke the stewardship responsibility of the accused, his guilt having been proven."

In the same respect, the referee organs have also pronounced themselves in other similar litigations in which the accused was the same petrochemical combine who failed to respect its assumed obligations and discharged noxious chemical substances in a stream, which rendered the water unsuitable for irrigation and thus produced damages to the cultivated land irrigated with that water (9). The conclusions of technical experts in these cases confirmed the statements of the units which underwent losses, and which maintained that their crops were destroyed through the exclusive guilt of the combine's managers, insofar as the residual water was insufficiently well treated by the combine. Finding that this situation was factual, the referee organs based their decisions on the grounds that the responsibility of the accused for the losses claimed by the injured party is defined in the provisions of Article 998 of the Civil Code.

In other litigations the same combine was forced to pay reparations for damages caused to crops as a result of polluting the atmosphere with noxious gases, vapors, and so on, released by the plants that form the combine; in these cases as well, the conclusions of technical experts have also demonstrated the guilt of the combine, who did not perform the measurements required to maintain emanations within prescribed limits, and did not take suitable steps to prevent pollution (10).

In the absence of regulations proper to the protection of the environment, the referee organs have thus used the traditional concept of civil responsibility based on existing legal definitions and on the fundamental principles of the institution of delict civil responsibility.

There is no doubt that insofar as scientific and technologic development constitutes a legal process with positive effects, the sources of danger that accompany this process can and must be removed in order to assure environmental protection. This is the sense of the measures adopted by lawmakers in the regulatory acts mentioned above, for the purpose of preventing polluting accidents. Some authors believe that the institution of civil responsibility for situations, in the form of objective responsibility, can play a significant role in encouraging enterprises to prevent prejudices caused by situations (11).

In our opinion, this concept in this domain does not help prevent and combat environmental pollution, and implicitly prevent the production of ecological damages; rather, it gives latitude to the managements of enterprises that work with polluting agents to take or not to take legal steps to avoid such losses, because damages cannot be imputable to them, this being a matter of objective responsibility.

The question naturally arises of how the institution of civil responsibility can put constraints on those whose job functions are meant to prevent environmental pollution, if in the case of damages caused by a failure to fulfill these functions, physical persons, managers of socialist units, or other working persons can hide behind the screen of "objective responsibility" to avoid being materially responsible for the sums paid as reparations to the victims of pollution.

The point of view expressed here is justified not by this aspect, or not only by this aspect of the problem, in the sense that it is the principle of civil responsibility for guilt, and not that of objective responsibility, which operates in the domain with which we are concerned.

Our state has taken all the necessary measures to prevent environmental pollution, and if pollution does occur at times, its cause must not be sought in the danger of the situation, but in the subjective attitude of those who work with polluting agents and who do not fulfill their duties. All the refereed decisions to which we have referred have found organizational and technical failures that have produced the damages, failures which are the fault of certain persons, or which have not been corrected on time by these persons.

Absorbed by the idea that in the case of objective responsibility, the victim need not have to provide any proof of the guilt of the person being sued for damages, and in this way can be compensated more readily and rapidly, the proponents of the theory of objective responsibility forget the costly consequences that arise in the holdings of socialist units which have to pay for compensations that cannot be recovered from the physical persons

ultimately responsible for causing the damages. That is so because in accordance with the provisions of Article 102 of the Labor Code, employees are responsible for damages to public property caused through their fault and in connection with their work. These persons are not responsible for losses inherent in production processes and which fall within the limits provided by law, for damages caused by unpredictable causes and which could not have been avoided, or in other cases, for losses that have been caused by normal job risks or by circumstances outside their control.

The judicial literature has expressed the point of view that the text of Article 102 of the Labor Code indicates that "in addition to normal job risks, relief from responsibility can also be granted for losses inherent to production processes, which fall within the limits stipulated by law, for circumstances beyond personal control, as well as for unforeseen causes that could not be avoided - or in other words, accidental cases." (12)

Under these circumstances, in a case where the responsibility of the unit for damages caused by environmental pollution would be based on guilt (Articles 998-999 of the Civil Code), employees could not benefit from the cases that would exonerate them from material responsibility since polluting accidents are - most often - caused by a failure to respect legal provisions designed in fact to prevent such accidents.

But if this responsibility is not based on guilt but rather is considered as an objective responsibility, the reparations paid by a unit cannot be charged to its employees since the damages to public property were not caused through their fault, and since it is known that material responsibility can be invoked only under these conditions.

The cases heard by the referee organs cited earlier have disclosed the undeniable fact that the pollution accidents were produced through the fault of the accused units, which did not take or did not respect the measures imposed by law to prevent environmental pollution, due to the passivity or negligence of the physical persons that had specific obligations established by law.

The judicial courts of Bacau County, also adopting the principle of culpable responsibility in such cases, have decided that the sums paid as reparations by socialist units are chargeable to the employees guilty of having produced the damages.

It was thus decided that the destruction of a family of bees was the fault of a unit which sprayed chemical substances without first warning the owners of the bee hives to move the hives, as required to do by the instructions given by the competent organ (13). The sums awarded as civil reparations to the owners of the hives, were subsequently charged - as material responsibility - to the persons guilty of failing to fulfill their job obligations (14).

From the above, we feel that we can conclude that civil responsibility constitutes an important instrument in the action of environmental protection.

In order to assure the best living and working conditions for the population, not only must we adopt specific measures for combating environmental pollution, but we must also apply as firmly as possible existing judicial institutions and principles of civil law which must have stimulating effects in strengthening order and discipline for environmental protection. We believe that this requirement can be met through the intermediary of civil responsibility, which in these cases is considered as a responsibility based on guilt, and which thus also fulfills the educational function of the law.

But in order for this judicial institution to acquire effectiveness, our literature has voiced the opinion that among other things it is necessary to "define the notion of ecological damage so that it will include indirect damages as well." (15)

While in the case of nuclear accidents the law has placed a maximum ceiling of 80,000,000 lei on damages (Article 37), the same is not true for the environmental protection law; we thus believe that the principle which applies in this matter is the principle of integral reparation for effectively suffered losses (damnum emergens) as well as for unrealized utilization (lucrum cessans).

This conclusion derives from the application, in the domain of delictual civil responsibility as well, of the principle defined in Article 1084 of the Civil Code, according to which "damages and interest owed to the creditor, generally include losses sustained and benefits of which he has been deprived." The judicial literature and practice of our country unanimously consider that although the citation above refers to responsibility for failure to respect contractual obligations, it nevertheless also applies to the domain of delictual civil responsibility. In fact, Decree No 208/1976 regarding the assessment of damages to public property caused by shortcomings or degradation of goods, provides that when the damage has been caused by civil lawlessness or infractions, that damage is assessed by adding a sum representing the use of which the victimized unit has been deprived.

The cited decisions of referee organs and judicial courts show that the principle used in all cases has been that of integral reparation of damages, a principle that operates within the framework of delictual civil responsibility (16).

For instance, in all the cases decided by the referee organs, the pollution of agricultural crops occurred during their growth period, when they were not ready to be harvested; despite this, the reparations awarded to the victimized units were not limited to the production costs incurred for plowing, seeding, and maintaining those crops (effective loss), but extended to the integral value of the crops that would have been obtained and sold, in other words, to the profits that were not obtained (17).

Because these are cases of damages to public property caused by degradation of goods, the losses must presently be assessed according to Decree No 208/1976, taking into consideration the prevailing prices at the time of the loss, or when the date cannot be determined, the prevailing prices at the time the loss was detected.

#### FOOTNOTES

1. 11th Congress of the Romanian Communist Party, Editura Politica, Bucharest, 1975, pp 656-657.
2. Ibid., p 808.
3. Ibid., p 818.
4. BULETINUL OFICIAL, I, No 92, 13 August 1975.
5. Y. Eminescu, "Limits of Possible Legal Actions in the Domain of Environmental Protection," STUDII SI CERCETARI JURIDICE, No 4/1976, p 352.
6. I. M. Anghel, "Responsibility Problems Arising in Connection With the Peaceful Use of Nuclear Energy," in Civil Responsibility, by I. M. Anghel, Fr. Deak, and M. Popa, Editura Stiintifica, Bucharest, 1970, p 216.
7. The expression "polluting accident" is derived from the expression "nuclear accident" used in the cited law, and the expression "ecological damages" belongs to Yolanda Eminescu, loc. cit., p 352.
8. Unpublished.
9. Central State Referee, Decision No 136 of 18 January 1973, and Decision No 3947 of 5 December 1973; Pitesti Intercounty State Referee, Decision No 17 of 7 January 1973 (unpublished).
10. Central State Referee, Decision No 2045 of 24 June 1974; Pitesti Intercounty State Referee, Decision No 1011 of 10 June, confirmed by the First State Referee in Decision No 2374 of 28 September 1974 (unpublished).
11. I. Iczkovits, "Considerations on the Responsibility of Socialist Organizations for Prejudices Caused by Their Works," ARBITRAJUL DE STAT, No 4/1966, p 63.
12. S. Beligradeanu, "Principles of Material Responsibility in the New Labor Code," REVISTA ROMANA DE DREPT, No 3/1973, p 77.

13. Bacau County Court, Civil Decision No 115/1975 and Civil Decision No 117/1975 (unpublished).
14. Bacau County Court, Civil Decision No 312/1975 (unpublished).
15. V. Eminescu, loc. cit., p 352.
16. M. Eliescu, Delictual Civil Responsibility, Editura Academiei, Bucharest, 1972, pp 453 and ff.
17. Central State Referee, Decision No 2045 of 22 June 1974, cit. supra.; Decision No 1490/1973 (unpublished).

11,023  
CSO: 5000

BRAZIL

ENVIRONMENTAL PROTECTION CONVENTION SUBMITTED TO CONGRESS

PY130346Y Brasilia Domestic Service in Portuguese 2200 GMT 12 May 78 PY

[Text] The convention banning the utilization of techniques to change the environment for military or hostile purposes, signed by the Brazilian Government in New York on 9 November 1977, was submitted today to the National Congress.

Pursuant to this convention, those countries represented in the United Nations vow to not promote for military or hostile purposes the use of these techniques, which may have [words indistinct] serious effects, or which may be designed to cause destruction or damage to other states which are signatories of this convention.

CSO: 5000

BRAZIL

ANTI POLLUTION EFFORT LACKING IN AUTONOMY, FUNDING

SEMA Problems, Successes Since Inception

Rio de Janeiro O GLOBO in Portuguese 14 May 78 p 11

[Article by Mateus Kacowicz, branch offices and correspondents]

[Text] The fight against pollution in Brazil is still structured, to a considerable extent, on personal examples, like the examples of Ruschi, who protected with the means available to him his small hummingbird sanctuary, threatened by the government of Espirito Santo, or of Lutzenberger, who from a fertilizer dealer became a severe critic of the artificial system of fertilization (which ends up by making the land sterile).

In the official area, the Special Secretariat for the Environment (SEMA) has not yet assembled data for determining an environment policy. SEMA is the federal agency under the Ministry of Interior.

On the state level, a good part of the units of the Federation have not yet established any agency connected with control of environmental conditions or, when there is such an agency, it rarely has sufficient autonomy -- and money -- to operate effectively.

The situation seems to be summarized by Hugo Werneck, president of the Minas Gerais Nature Conservation Center: "Federal legislation is scant, not very consistent and very complacent. Penalties are symbolic and companies prefer to pay the ridiculously small fines that to adjust to the conservation requirements." Werneck states the following, citing a Minas Gerais example that could be expanded:

"The Environment Policy Commission (COPAM) may point out errors and indicate penalties, but punishment is assigned directly to the presidency of the Republic. This is absurd and leads the battle against pollution in Brazil to be at the mercy of a partisan policy and not of a true ecological policy.

#### SEMA: One Station in Four Years

Brasilia (O GLOBO)--Four and a half years after its establishment, the Special Secretariat for the Environment (SEMA), under the Ministry of Interior, achieved, in practice, its first victory. The first of the 20 scheduled ecological stations is being set up. It is the one at Maraca, in Roraima, where the Environment Secretary, Paulo Nogueira Neto, has moved.

Ten more ecological stations will also be established this year, in accordance with Nogueira Neto's schedule: Taim (Rio Grande do Sul), Aracuri Esmeralda (Rio Grande do Sul), Raso da Catarina (Bahia), Urucui-Una (Piaui), Anavilhans (Amazonas), Ique-Aripuana (Mato Grosso), Aiuba (Ceara), Pantanal do Sul (Mato Grosso) and Piria-Gurupi (Goiás).

In these 4 and a half years, SEMA has not yet even succeeded in having the government approve specific legislation on the environment that will bring together and greatly expand what there is by way of decrees, resolutions and other acts, both within the scope of the Ministry of Interior and in other federal areas. It also has not achieved establishment of the Environment Fund, intended for receiving funds from polluting industries and federal grants to carry on the fight against pollution. According to SEMA technicians, the establishment of that fund has not yet occurred "owing to obstacles set up by industrialists and some technocrats."

Precisely because of the nonexistence of that fund, Paulo Nogueira says that SEMA "is living in a contradiction." In other words, it is trying to check scientifically on pollutants and their origin, without having sufficient financial and human resources. Since it does not have the actual requirements for identifying and determining origins of pollution, SEMA has no means of dickerling with the government to obtain legislation on the environment.

The solution for achieving reasonable results, at least on the bureaucratic level, is the signing of agreements with other agencies. The most important one was made with the Applied Economic-Social Research Institute (IPEA), which is encouraging the introduction of the National Environmental Control System (SINACAM).

The first study originating from that agreement is going to identify the cost of pollution in economic terms. It will be one more card on the table for SEMA for proving to the government the urgency of legislation on the environment and pollution, because the study will prove that, on every level and in every sector, it is less burdensome to prevent and control pollution than to correct its effects subsequently.

#### Awareness Strategy

In spite of the difficulties under which pollution control and combating agencies are operating in Brazil, some positive results are being achieved. As an example, Paulo Nogueira Neto mentions that atmospheric pollution in

Sao Paulo decreased last year, "owing to strict action by CETESB [Basic Sanitation Technological Center] and PETROBRAS [Brazilian Petroleum Corporation], which improved the level of oil distributed in the critical months.

"But we have achieved success in an extremely important area, public opinion. The year 1977 was marked as the year in which the people of Brazil awakened to ecological problems and began to struggle to preserve our ecology, at least in the most flagrant cases."

This year, SEMA is struggling to attain greater vigor in the activities of public administration in protection of the ecology and in controlling environmental pollution. In a lack of funds for ambitious programs with practical, immediate results, SEMA is aiming at a strategy of awareness that also seeks to reach the National Congress.

In the opinion of the SEMA technicians, legislation on the environment depends greatly on the members of Parliament. They fear that, when the minister of interior forwards draft legislation to the president of the Republic and the president sends it to Congress, there will be much pressure by industrialists to amend it or even to pigeonhole it. This is because the legislation will give rise to expenditure by industries to contain pollution. In many cases, efficient means of control cost as much as 10 percent of the cost of setting up an industry.

Another important fact, in the opinion of Paulo Nogueira: "Not only the people, but industries themselves are concerned, at present, over the pollution that they may cause. Some more enlightened managers are taking steps to prevent it.

#### Stepping on Corns

"SEMA tries to be reasonable in everything that it does and, therefore, it is obtaining understanding and respect. We step on the corns of many persons, but, although we go against their interests, they all respect us."

Paulo Nogueira finds that all this brings credibility to the work performed by SEMA. "They all complain, but they finally agree to accept our requirements."

Last year, the expression "ecological disaster" began to appear frequently in the press. There was much sensationalism, SEMA technicians admit, "but it was good to help us fight." The environment secretary believes that last year's "disasters" might have been much worse and even with catastrophic consequences. Among them are the one of Ajinomoto, which affected the Piracicaba River, in Sao Paulo; SOICOM, a cement plant in Vespasiano, Minas Gerais, that polluted a whole district with its dust; CENIBRA, a cellulose plant that polluted the Rio Doce, also in Minas Gerais.

Now a pollution has come up in the southern part of the country that may be tied to negligence in the case of an accident. The gas affecting the bathing resort of Hermenegildo may have come from steel tanks with chemicals sunk with the ship Taquari.

Nogueira Neta also mentions the Ruschi case, when public opinion was mobilized to help save a small biological reserve in Espirito Santo. In the BRASCRAFT case, for the first time in the history of Brazil, a company had to spend large amounts of money to bring to public opinion a message that it would not endanger the environment. All that, in the opinion of Paulo Nogueira, shows that "much more is being achieved than can be imagined: ecological awareness."

#### Environmental Bills Submitted to Congress Since 1974

Rio de Janeiro O GLOBO in Portuguese 14 May 78 p 11

[Text] Brasilia (O GLOBO)--If the bills connected with ecology submitted in the last two legislatures are analyzed, it is observed that, starting in 1974, the Federal Chamber has shown more awareness of preservation of the environment. While only three bills were submitted under the Medici administration, 18 have already been submitted in the present administration. Most of these bills, however, pertain to regional problems, as suggestions for the establishment of ecological reserves.

In the last legislature, from 1970 to 1974, only three bills pertaining to ecology were submitted. One suggesting the inclusion of Human Ecology as a course in the curriculum of first and second grades. Another asking for recognition of the profession of sociologist to be regarded as responsible for the course proposed in the previous bill and, finally, a bill on a tourist survey of the Rio de Janeiro-Santos highway.

#### Senate

In the Senate, only three bills of an ecological nature have been submitted since 1974: a bill by Senator Vasconcellos Torres, prohibiting the utilization of chemical agents in clearing forest land (1974); a bill by Senator Nelson Carneiro, asking for the immediate abolishment of whale fishing (1978); and a proposal by the Executive approving the International Commerce Convention for Flora and Fauna.

Both in the Chamber and in the Senate, the bills have either been rejected or have been pigeonholed, awaiting an opinion or even distribution. Many times, bills are merely pigeonholed when conflicts with current legislation are perceived or because the point provided for in the bill already exists by law. Some are infeasible, like two requiring the planting of fruit trees in re-forestry areas. At any rate, they all have the good intention of protecting the environment.

The following are the bills tied to ecology submitted in the present legislature, since 1974, in the Chamber of Deputies:

Deputy Jose de Assis (1975): Provides for the inclusion of a course, Flora Studies, in the curriculum of the first and second grades.

Deputy Joel Ferreira (1975): Establishes the School of Agronomy and Veterinary Medicine in Parintins, in the state of Amazonas.

Deputy Lygia Lessa Bastos (1975): Establishes rules for the growth of cities with a population of over 200,000 inhabitants.

Deputy Genervino Fonseca (1975): Bill creating the Itabocas National Park, in Goias, at the confluence of the Araguaia River and the Tocantins River.

Deputy Otavio Ceccato (1975): Provides for mandatory reforestation by companies engaging in the extraction of wood.

Siqueira Campos (1975): Provides for tax incentives for forestry enterprises, asking that the planting of fruit trees be included in them.

Deputy Francisco Amaral (1975): Provides for the utilization of forestry raw material (charcoal) as a source of energy.

Deputy Jorge Arbage (1975): Prohibits the cutting of fruit trees.

Guacu Piteri (1975): Includes a course, Elementary Ecology, in the curriculum of the first and second grades.

Lauro Rodrigues (1976): Amends the Forestry Code to protect natural vegetation in metropolitan areas.

Nelson Thibau (1975): Bill prohibiting the cutting of trees needed for urban beautification.

Pedro Lauro (1976): Amends the Forestry Code, prohibiting clearing for the production of charcoal.

Alencar Furtado (1976): Includes a course, Elementary Ecology, in the first grade.

Alencar Furtado (1976): Bill providing for the establishment of forestry parks in every municipality for preservation of the environment.

Alexandre Machado (1977): Prohibits the manufacture of chlorinated insecticides and condemns their use.

---

Lauro Rodrigues (1977): Proposes an amendment of the Forestry Code to allow an area owner to turn a heterogeneous forest into a homogeneous forest by means of cutting down or burning.

Jose Camargo (1978): Provides for mandatory installation of pollution control equipment in industries.

10,042  
CSO: 5000

---

## BRAZIL

### IMPACT OF POLLUTION ON GUANABARA BAY DISCUSSED

Rio de Janeiro MANCHETE in Portuguese 20 May 78 pp 122-123

[Article by Arnaldo Cesar Jacob]

[Text] "There is one point in the universe where the hand of the Creator seems to have taken pains to gather together the broadest range of beauty, accumulating what could enchant the eye and enrapture the mind. It is Rio de Janeiro Bay, magnificent and marvelous." These words were written in 1822 by Francisco Bernardino de Souza, one of the first persons to organize tourist trips to the heart of Guanabara Bay. Certainly the picture has changed throughout these 150 years. There is no longer anything to justify the adjectives "magnificent and marvelous." Today, every second, 8,000 liters of sewage settles to the bottom of the bay without any prior treatment. Every day, 350 tons of refuse are dumped on its banks, not to mention the 7,000 liters of oil which escape from ships every month. The bay is sick. The water level is dropping and successive dirt-fill operations have devoured 30 percent of its natural shape in a century. The pollution of the bay has reached a point at which it is currently regarded as one of the major ecological problems in the country. On the basis of this situation, the SBPC [Brazilian Society for the Advancement of Science] decided last week to sponsor a broad debate about the problems of the bay. To this end, it gathered together 50 scientists and researchers in the auditorium of the Microbiological Institute of the Rio de Janeiro Federal University. For five days (from the 24th to the 28th of the month) the participants held discussions ranging from the biological aspects to the consequences of an economic and social nature. Although the symposium served solely to revive old theses, it also aroused some concerns. Innumerable warnings were voiced by the scientists. At the end of each statement, the certainty emerged that if urgent measures are not taken, the bay may be transformed into "a vast garbage dump." What should be done to avoid this fate? The answer is not simple. Entrapped between the Serra do Mar and the Rio mountain range, Guanabara Bay occupies an area of 381 square kilometers. Along its 160 kilometers of shoreline 7 million individuals live, 70 percent of the population of the state of Rio de Janeiro. There are 16 cities with their 6,000 factories, representing the second-largest industrial park in the country.

It is a sea of problems. The ailments of the bay are reflected in every sector. The first to be affected were perhaps the fishermen. A study released by the SUDEPE [Superintendency for Development of the Fishing Industry] two years ago stressed that in 1968, there were 12 fishing settlements on the inner side of the bay with a production running to about 58 tons per year. Five years later, the fishing volume and the number of settlements had been reduced by half. Those remaining cannot obtain even five tons a year from the cloudy waters. In any case, the fish they succeed in catching are condemned. One of the best-attended lectures at the SBPC symposium, which was delivered by biologist Wolfgang Pfeiffer, of the Biophysics Institute at the Rio de Janeiro Federal University, revealed the discovery of chromium in the marine flora and fauna on the west side of the bay. A byproduct of industries using electrodisintegration processes (chrome plating), this chemical product is regularly being incorporated in the food chain, even reaching the human organism, in which it causes the breakdown of mucous membranes. Another biologist, Professor Nadir Trancoso, studied the incidence of mercury resulting from the use of pesticides in farming in the lowlands of the state of Rio de Janeiro. Of the 113 fish caught, 11 were contaminated. This is an index high enough to lead that scientist to warn of the danger that a tragedy similar to that which occurred in the Minamata Islands on the Japanese coast may be repeated in Rio de Janeiro. There, the accidental dumping of mercury caused serious difficulties for almost two million persons. Many of them, after being contaminated by the mercury, died or were paralyzed. Despite all of the studies made to date, both the authorities and the researchers say it is impossible to establish the level of contamination in the waters of the bay at present. Thus all they are sure of is that the sewage discharge "is extreme." The FEEMA [State Environmental Engineering Foundation], one of the bodies established by the government to deal with the matter, has succeeded in the past three years in persuading 157 of the 1,000 industries to install filters and small treatment stations for their effluents. Sanitary expert Breno Marcondes da Silva, of the engineering faculty at the Rio de Janeiro State University, explains that of all of the forms of pollution found in the bay, the most harmful are industrial wastes. "In addition to requiring costly solutions to the problem, this type of discharge has unpredictable consequences. No one is certain about its effects on the flora and fauna." To obtain some idea of the seriousness of this type of contamination, it suffices to recall that the PETROBRAS [Brazilian Petroleum Corporation] refinery in the city of Duque de Caxias, Rio de Janeiro, will invest two billion cruzeiros in anti-pollution equipment. This sum is almost enough to build a new refinery.

#### Contaminated Beaches

In the opinion of the president of the Convention for Pollution Control in Guanabara Bay (a body affiliated with the Ministry of Navy), such cases as that of PETROBRAS are likely to recur in the future. Commander Ronaldo Santoro has two justifications for his argument: the first is the risk that pollution will become so great as to threaten the polluting

enterprise itself, and the second has to do with the oil crisis. The high price of that product on the international market has made the utilization of substances which were excluded in the past financially viable.

This is true to the extent that PETROBRAS finally underwrote the construction of a special vessel for collecting the oil spilled in the bay. This vessel, named Pureza, recovers an average of 2,000 liters of oil per month from the water. The results have been so encouraging that there is now discussion of plans for a sweeper vessel to collect floating refuse. These very sophisticated measures would be unnecessary, however, if the bay were not the final destination for the waters of the canals, rivers and sewage networks. The majority of the bay's 100 beaches fall below the safety standards established for bathing resorts by the Special Environmental Secretariat. At all of them fecal pollution coming from the sewers is found. In 1973, microbiologist Hermann Schatzmayr isolated a virus at the beaches in Icarai, Niteroi and on Governor Island, which caused diarrhea and vomiting in some bathers. No one seemed upset by this and the beaches continued to be frequented as usual.

#### By the Year 2030

The reduction and silting up of the bay are not new developments. Since the time when the Tamoio indians called it Wa'na'pa'ra (the river which imitates the sea), its shores have been shrinking. The fact is that in recent decades this process has accelerated excessively. Those who have studied this sudden change give the bay 80 more years of life. By the year 2030, a half of it will be dry, or in the worst of cases, will be a swamp.

To some extent this view is shared by scientist Elmo da Silva Amador, whose thesis had an impact on the SBPC symposium. The careful drafting of geological maps and a field study which required three years of measurements at the widest variety of points along the bay led Silva Amador to an interesting conclusion. In the period between the years 1938 and 1962, there was an average decrease in depth of 81 centimeters. This means that the bay is being lowered at the rate of a centimeter a year. Its shrinking, according to Silva Amador, is due in great part to indiscriminate clearing and landfill operations justified by the most varied pretexts. Some of these have caused absurd ecological situations, such as an artificial island of garbage which sometimes appears opposite warehouse 22 on the Praça Maua port docks. Pushed by the winds and the tides, it regularly causes weird hindrances to shipping traffic. Incredible though it may seem, it is government bodies which have been the greatest contributors to the shrinking of the bay to date.

In 1930, a strip of 300 square meters was filled in for the Manguinhos Airport. Then came the dumping of the Caju refuse, involving 500,000 square meters more. Recently, two more airports, Santos Dumont and the Galeao

International Airport, have taken away 2 million square meters more. For the building of the Galeao International Airport, a major water circulation channel was interrupted, creating a swamp along the northern part of Governor Island. Could there be a solution to the problem of such depredation? Engineer Victor Coelho of the FEEMA made a point of making it very clear to the symposium that the bay problem depends "above all on an economic definition." For the sewage waste aspect alone, a basic sanitation program for the greater Rio de Janeiro metropolitan region would be needed, with the execution of very costly projects, including sewage interceptors, hoisting and treatment stations. According to Coelho's estimates, such a program could be completed in 30 years and would require the astronomical sum of 15 billion cruzeiros. In fact, even such a sizable sum of money would not suffice. Coelho himself agrees that the majority of the plans and projects which have been studied in the past ten years have been rendered obsolete by the population and the industrial growth in the region. IBGE [Brazilian Institute of Geography and Statistics] figures indicate that cities such as Nilopolis, Nova Iguacu, Sao Joao do Meriti and Sao Goncalo, in Rio de Janeiro, have practically doubled in population since 1972. The slums, another major problem, have developed similarly, but with an aggravating factor--they are developing almost all around the bay shoreline, where the land is state-owned. Sanitary engineers know that dazzling sanitation projects alone will not save the bay.

The SBPC symposium seems to have left all the participants concerned with obtaining from the government a definition of a policy for the settlement of the metropolitan region area as soon as possible. If such is not obtained, the "magnificent and marvelous" bay described by the enthusiastic Bernardino de Souza, which once "enraptured the mind" will become a torment to it.

5157  
CSO: 5000

---

BRAZIL

PROBLEMS, SOLUTIONS TO POLLUTION IN INDUSTRIAL AREAS STUDIED

Rio de Janeiro O GLOBO in Portuguese 14 May 78 p 10

[Text] Mercury, cadmium, titanium, lead, sulfur, chromium; sulfuric and hydrochloric acid; cement and stone dust; carbon monoxide, hydrosulfuric gas, various odors; coliform bacilli, biomass, and excrement.

These terms are gradually emerging from scientific reports to become the small change of everyone's conversation: they are the new ingredients in the daily diet of the developing cities.

Fishermen in Recife, housewives in Rio de Janeiro, farmers in Rio Grande do Sul. The problems are becoming more obvious, causing a reaction among the common people, accustomed to viewing the Japanese seen on television wearing masks as protection against photochemical smog as a curious and distant phenomenon.

The deterioration of the environment has ceased to be a characteristic of the industrialized countries in the northern hemisphere. The positions are now reversed: there is no longer smog in Tokyo, it has moved to Sao Paulo; one can fish again in the Thames in London, while it is no longer possible in some forest waterways in the Amazon.

Jose Canabrava de Mendonca, a Bank of Brazil official and an outstanding member of the Molinete Fishermen's Club, was already impatient. He had been dangling his bait for 4 hours without any result. Acknowledging defeat at the end of the afternoon, Mendonca went home. It was the first time in his life as a fisherman he had returned without at least one miserable yellow grunt.

This happened in Aracaju, on the Atalaia beach, in 1973, and Mendonca reached home covered with oil. The Carmopolis oil terminals and the tankers which dock there had made one of their first enemies.

"Today," he says, "I do not venture to go fishing at Atalaia. There are no more fish, nor crabs, no more life. The oil is killing everything."

The pollution of the waters, either by oil, industrial waste or sewage, seems in Brazil to be the most serious problem in the deterioration of the environment. This is what there is in common between Guanabara Bay and the forest waterways in the Amazon.

At least one of the most important aspects of current pollution has already been dealt with, until a short time ago, as a separate problem: sewage. About 70 percent of the urban population in Brazil is not served by any kind of sewer network. In the majority of cases, sewage is emptied into uncovered ditches, running from there to the nearest ravines and on to Rio and the sea. Where sewage networks exist they are in the majority of cases near canals which carry used waters to some dumping area, without any treatment.

The Guanabara Bay situation is illustrative. In its environs about 7 million persons live, fewer than 3 million of them being served by any kind of sewage network. About 350 tons of sewage, the greater part of the volume in a natural state, flows into the bay daily, according to the FEEMA [State Environmental Engineering Foundation].

According to the technicians, the origin of the trouble lies in the accelerated rate of urban growth seen in the country in the past 20 years. Forced out of the rural sector and attracted by the cities, individuals have arrived at a rate exceeding the investment and welfare capacity of the municipalities.

This has led to a situation such as that found in the Amazon region. Prof Camilo Viana, president of the Society for the Preservation of Natural Resources in the State of Para, and a professor on the faculty of medicine at the State University, says that environmental pollution problems in all the cities and human conglomerates in the Amazon region are the result of the lack of a health infrastructure.

"Fecal waste and household sewage are simply dumped into the canals which cut through or around the cities, converting them into real rivers of sludge and illness."

A similar situation is reported by an EMBRAPA [Brazilian Agricultural Research Enterprise] technician in Terezina. The Poti and Parnaiba Rivers have already been polluted with bacteria at an index higher than that acceptable for the human body. And in the case of the state of Piaui, the state government seems to be contributing the greater part of the pollution: the Getulio Vargas Hospital, the largest in the region, swells the current of the Parnaiba, 500 meters from the business center, with its refuse.

A similar situation exists on the Anil River, which flows around the island of Sao Luis, the capital of Maranhao; on the Potengi River, which is the recipient of the untreated sewage water from 35 houses in the city, since the only station ceased operation 13 years ago; on the Goiana, Igarassu,

Capibaribe, Jaboatao, Gurjau, Pirapama, Ipojuca, Serinhaem, Una and Mundau Rivers, in Pernambuco; and in the Tainheiros cove, on Todos os Santos Bay. Of the water courses which cross the so-called Greater Rio region, not a single one has ceased to be used as a sewage canal. The same is the case with the rivers running through Sao Paulo and the other economically developed capitals. They are dark liquid currents, lifeless and slow-moving.

Basic sanitation, therefore, as the technicians have noted, would be one of the first fronts to be attacked in an overall program to combat pollution -- health care of the peripheral and poor populations, and treatment of the effluent in technically adequate stations.

#### Progress Entails Difficult Pollution Problems

But if human refuse can be regarded as a problem to be overcome with the process of economic growth, since in the product of the poverty of the people or the country, in the final analysis, this same growth can be blamed for the development of a type of pollution the solution of which is much more complex.

While a station for the treatment of sanitary waste requires relatively simple technology, known to Brazilian health technicians, the recycling of industrial waste is very often complex and costly, leading businessmen to avoid it in order to keep their profit margins the same.

Some even make the pollution they produce a point of pride. An example is Roberto Brauer, general director of the Ponsa Paper and Corrugated Cardboard Factory. He claims that the caustic soda dumped by his plant into the Goiana River in Pernambuco, which has destroyed any trace of life in its 42-kilometer length, is "the price required by progress."

This price can be expressed in various currencies, apart from the caustic soda which flows in the Goiana River: titanium, chromium, mercury. All of these flow freely through Brazilian waters.

The waters of Tainheiros cove in Salvador bathe the shores of the largest slum in Brazil, Alagados. A large part of its population supplements its daily diet with two types of mollusk which are abundant in the cove, known as papa-fumo and lambreta. This food supplement would be useful if it were not for the discharge of about 10,000 kilograms of mercury in the waters of the cove by the Port Area Chemical Company, a subsidiary of PETROBRAS [Brazilian Petroleum Corporation] since 1967.

When this situation came to the attention of the public, studies were begun by the CEPED [Research and Development Center] to determine the likelihood that the population of Alagados (100,000) would contract the Minamata disease, named after a Japanese bay where a number of fishermen died from mercury poisoning. According to Edson Pitta Lima, president of the State Environmental Protection Council, there is no point in any comparison yet between

the situation in the bay area and that in Japan, because Brazil has not yet had any deaths. The research is continuing, now being pursued by postgraduate students in community health at the Federal University in Bahia.

In Alagoas, 200,000 tons of chlorine in the form of hydrochloric acid are dumped into the sea by the Salgema Chemical Industries. This information is provided by the state environmental coordinator, Jose Geraldo Marques. He does not know if this discharge can affect the ecological balance in the area.

Again in Bahia, the contamination of the Subae River and its estuary in Todos os Santos Bay is perhaps even more serious than the contamination of Tainheiros cove with mercury, in view of the technical director of the CEPED, Jose Adeodato Neto. The responsibility for the discharge of these substances falls to the COBRAC [Brazilian Lead Company], which has operated in Santo Amaro da Purificacao, about 85 kilometers from Salvador, for 16 years, having released 400 tons of cadmium, without treatment, into the Subae River by 1976.

According to the CEPED, the factory, which belongs to the French Penarroya group, did not install anti-pollution equipment until after the state government made it obligatory.

The Bahia basin, a zone of rapid industrialization, is becoming a living laboratory, in which the effects of intensive dumping of chemical effluent are being tested on the people. It is also in Bahia that the problem of the effect of chemical discharges is greatest.

Arembepe is a tourist attraction, as shown on a postcard made available by the Bahia tourism company. TIBRAS [Brazilian Titanium Corporation] was built there and it discharges a mixture made up of sulfuric acid and ferrous oxides directly into the sea. This discharge is the cause of a yellowish band of water which extends along the coast from Itapoa beach to the mouth of the Jacuibe River, some 40 kilometers away. In the view of the factory officials, this is merely "visual pollution." But for the fishermen in the Z-6 settlement in Itapoa, net fishing in that sector is finished.

In addition to the effluents common to various industrial zones existing in Brazil (they are concentrated in the Rio-Sao Paulo-Belo Horizonte triangle), the Brazilian Northeast has a typical kind of pollution, caused by the refuse from the industrial processing of sugarcane by the plants there.

Jose Geraldo Marques, state environmental coordinator for Alagoas, estimates that in his state alone there is 1.5 million liters per day of such refuse produced by the 18 plants in his state.

The situation in some northeastern states has reached the point that the church has raised its voice as the spokesman of the threatened population.

The pastorate of the fishermen in the Second Northeast Region recently sent a signed petition to President Geisel demanding measures to contain the pollution of the Goiana, Capibaribe, Pirapama, Jaboatao, Cabo, Igarassu and Botafogo Rivers. Here, the fishermen claim, pollution poses a serious threat to survival: the killing of fish and crustaceans is a general phenomenon, the rivers are completely depopulated, and the human population is moving away from the points on the coast where they empty into the sea.

In addition to this, the petition continues, "daily contact with the polluted waters is causing skin ailments and serious headaches, irritation of the eyes, dysentery, vomiting and poisoning, incapacitating the fishermen for any other kind of work."

The fish, which represent one of the economic mainstays of the region, providing permanent employment and a food alternative to the coastal populations, are in danger of extinction. The area included between the Pontinha, Canoe, Carne de Vaca and Ponta de Pedra beaches on the northern coast of Pernambuco, and Acau and Pitimbu, in Paraiba, affected by the discharge of paper and corrugated cardboard plant and factory refuse, may cease to be the most productive on the whole of the northeastern coast, in terms of fish.

Paper and cement plants, for their part, are responsible for various problems in many regions. In addition to the Ponsa plant, owned by the Klabin group, which discharges its refuse in the Goiana River, Prof Camilo Vianna of the Federal University in Para points to the Joao Santos group as responsible for the transformation of the Uricuri River in his state into a canal filled with green sludge. He reports that instances of death caused by immersion in the poisoned waters of the Uricuri are constantly occurring.

The professor further notes other causes of the destruction of the environment in the Amazon region which will soon be operational: the extraction of bauxite in Trombetas; the ALBRAS [Brazilian Aluminum Corporation, Inc.] - ALUNORTE project for the production of aluminum in the environs of Belem and the Jari Florestal paper plant. In the opinion of Camilo Vianna, the paper plant project is doubly harmful to the region, for in addition to causing the pollution typical of any paper factory, it will use wood from the region itself as fuel, with the resulting devastation.

Again in Piaui, the Joao Santos group is building a paper factory in the neighboring state of Maranhao which will discharge its refuse into the Parnaiba, the second northeastern river which serves the capital of Piaui.

#### Serious Devastation in Minas Gerais

Minas Gerais provides an acute example of the indiscriminate devastation of the natural environment. "Fifty years ago, 45 percent of the territory in Minas Gerais was covered with wood; today only 7 or 8 percent remains." Warning or exaggeration, this report comes from the Minas Gerais secretary of agriculture, Agripino Abrantes Vianna.

When it comes to establishing responsibility, there is no great difficulty: initially it was the prosaic steam locomotives, but now it is the metallurgical plants which burn charcoal.

But Minas Gerais, in terms of environmental devastation, is a special case, with problems ranging from the forms of pollution which most directly affect the life of the people, such as industrial pollution, to the devastation of forests and water resources, to the extinction of rare animal and plant species and the destruction of sites with great archaeological value and historic monuments.

The Environmental Policy Commission, a collegiate body working to safeguard the environment in Minas Gerais, has in its short history (it is just over a year since its founding) had some effect on some cases which could be regarded as typical of the process of devastation occurring in the state. Recently the MBR [Brazilian Mines Association] requested a license to cut 43.92 hectares of forest land in Jambeiro -- the last forest reserve in the Belo Horizonte metropolitan region. After careful study, authorization was refused. Instead of 43.92 hectares, only 212 could be cut. A license was granted for the cutting of the 10 really necessary hectares, and the enterprise was required to adopt environmental safeguards.

The action of the COPAM [Environmental Policy Commission] has also been effective in reducing the level of pollution in Vespasiano, where a defect was found in the electrofilter at the Soecom cement enterprise. The commission established that the enterprise production was hindered by 50 percent until the new filter was installed.

But the COPAM has a rather limited area of action (see the legal text on the environmental preservation policy) being unable, for example, to prevent the destruction of the Lapa Vermelha grotto, regarded as an excellent source for the study of prehistoric times, to make cement production possible.

Nor has it prevented the gases released by the Alcan aluminum plant, located in the Saramenha district in Ouro Preto, from destroying the paintings and other artifacts in the ancient churches in that historic city, as Father Jose Simboes Filho, the Matrix do Pilar vicar, has charged.

Nor could it prevent a patch of oil from spreading along the entire Doce River from Belo Oriente to Espirito Santo, because of a defect in the CENIBRA factory located in that municipality.

One of the serious problems which has been resolved through the COPAM, however, is the matter of air pollution in the Belo Horizonte metropolitan region. The installation of filters in the chimneys of the Itau, Souza Cruz, Soecom and Mannesmann factories have spared Belo Horizonte the discharge of 611,000 kilograms of dust daily, or 219 million kilograms per year.

The discharge of aerial refuse by cement plants was occurring at such a high volume that an unprecedented juridical problem developed: the LAFERSA [Rolled Steel Corporation] in the Contagem industrial district charged Itau Cement with causing damage to the health of its employees, as well as material damage to its installations. LAFERSA won the case.

#### Status for the Industrial District

Whether or not it is a capital city, having an industrial district has in recent years become a point of honor for every municipality. One who wants to be elected prefect must promote the installation of mercury vapor lighting, the provision of flower beds for the town square, the building of a viaduct, and, inevitably, the establishment of an industrial district.

Generally speaking, the development of an area intended to contain industrial facilities is not preceded by any study with a view to establishing the economic potential of the region or how an industrial park can be built in the region lacking a sanitary infrastructure, or providing for the safe disposal of the waste which will be created in the course of the production processes.

Sao Paulo, which has undergone a natural process of industrialization, is now seeking to direct the expansion of its industrial park.

One of the most recent measures adopted in this connection was announced recently by the director in charge of pollution control at the CETESB [Basic Sanitation Technological Center], Nelson Nefussi. He revealed that at least 100 industrial plants which contribute greatly to pollution in the capital city will have to make changes if they do not want to pay heavy daily fines.

This step was announced just at the beginning of the winter season, which in Sao Paulo means burning eyes and bronchial and skin irritation. It is the season when thermic inversions keep a large part of automobile and chimney exhaust trapped over the city at a low altitude.

But while the government of Sao Paulo is taking every possible step to correct the situation which goes back several decades (the first Sao Paulo experience with a major ecological accident was 23 years ago, when the Cubatao refinery discharged a superdose of petrochemical pollutants into the Maua River, marking the death of that water course), other governments, perhaps less experienced or willing to pay the price, are allowing industrial plants to be built without major restrictions.

In Rio de Janeiro, the FUNDREM [Metropolitan Region Foundation] has been making a detailed study of the location of industries in each of the 14 municipalities which make up the region, analyzing 15 factors making possible a profound diagnosis on the metropolitan and municipal levels.

In Terezina, where there is no body entrusted with the control of or battle against pollution, the industrial district was improperly located right on the edge of the city. In the view of technician Walmir Miranda of the Federal University in Piaui, industrial pollution will be inevitable in Terezina, although none exists yet, if large polluting industries are built.

The industrial sector in Natal may serve as an example of what the development of a planned industrial district can be like. The area allocated for industry is located more than 35 kilometers from the city, and in addition to the distance, the type of industry in Natal may make of it a privileged city in the northeast. Traditionally the Natal factories have been based on nonpolluting textile processes.

But while the government of Rio Grande do Norte has foreseen the need to keep industries concentrated in a given sector, it is also drawing criticism of architects, university and newspaper professionals. Going against the provisions of its own environmental control body, the state government has drafted a highway project which will cut through the dunes surrounding the whole of the capital city, representing a relatively well preserved ecosystem. It is charged that the "Dunes Park" which the government is seeking to create is really nothing but a real estate project.

5157  
CSO: 5000

## SOURCES OF AIR POLLUTION ANALYZED

Baghdad AL-JUMHURIYAH in Arabic 11 May 78 p 12

[Article: "The Worsening Problem of Air Pollution"]

[Text] According to history, the Romans were the first people to use metal pipes for the distribution of water to homes. And since the metal used for this purpose was lead, the result was the contamination of the water system with poisonous lead compounds.

From the beginning of the industrial revolution, man has attempted to harness nature and put its resources at his disposal, and this practice is beginning to harm man himself. According to a scientific study, 90 percent of cancer related diseases, heart, lung and respiratory ailments are caused by pollution of the environment. A second study describes the phenomenon of environmental pollution as the undesirable consequence resulting directly or indirectly from man's interference with nature in the areas of energy, radiation, chemical and physical changes, in a manner that is injurious to living things.

Contaminated air enters the respiratory system in the form of a mixture of particles, gases and vapors, some toxic and some harmless. The mucous covering of the respiratory system reacts with the sulfuric acid, ozone and nitric oxides present in the contaminated air, and this intensifies the acuteness of chronic respiratory diseases. Smokers, in particular, are subject to this effect. These reactions are also responsible for the breakdown of nucleic acids and the creation of carcinogens. Among the principal air pollutants are:

- 1) Carbon monoxide, which is produced in connection with the incomplete burning of fuels such as hydrocarbons;
2. Nitrogen oxides, including nitrous, nitric and nitrogen dioxide, which result from burning as well as from certain biological processes in the soil and the action of lightning. Nitrogen dioxide is opaque to ultra-violet radiation and induces photochemical reactions which are responsible for the formation of smog in air-polluted areas;

---

- 3) Hydrocarbons, which are produced as a consequence of burning coal and wood, and in the evaporation of industrial solvents. The burning of gasoline, in particular, contributes to the creation of hydrocarbons;
- 4) Particulate matter, the principal component of air pollution, results from several sources including industrial ashes and soot and mechanical operations. Particulates fall on buildings and trees and are removed by rain from the atmosphere. Some major sources of particulate matter are active volcanoes, earthquakes, forest fires, nuclear explosions, soil erosion, animal and other organic residues, which often include gases, vapors, smoke, agricultural byproducts, pollen, etc., Other sources include mining operation, petrochemical industries, military industries, as well as agricultural and construction operations;
- 5) Noise pollution, that is, non-musical sounds whose effect is to reduce man's productivity, and weaken his sense of hearing. Explosions, cars, trains, supersonic aircraft and industrial plants are major sources of noise pollution especially in crowded cities;
- 6) Miscellaneous sources of air pollution include hydrogen sulfide which changes to carbon dioxide and carbon trioxide [sic]. Because of the presence of water vapor in the atmosphere, it combines with the latter to form sulfuric acid and salts. Eight percent of this air pollution results from the burning of fuels with a sulfur content, smelting operations, petroleum refining operations, volcanic gases and the decomposition of organic matter.

The particles found in contaminated air, including gases, vapors and solid matter often contribute to smog formation and lower visibility during the day.

While Iraq is not afflicted with air pollution problems in comparison with industrial nations where smoke, dust, vapors, gases, radiation, noise and other sources of pollution abound, we do have some sources of pollution including brick factories, refineries, automobile exhaust, industrial smoke, fertilizer and battery plants, cement and paper plants, in addition to dust, heat and noise in our expanding population centers.

Our political leadership is increasingly concerned with safeguarding the environment as evidenced by the many cooperative studies that are being jointly undertaken by the government and other institutions. The government has created an office of the environment whose task is to encourage forestation in the vicinity of cities in order to reduce dust carried by the wind.

9063  
CSO: 5000

LEBANON

MARINE POLLUTION CONTINUES UNCHECKED

Beirut THE ARAB WORLD WEEKLY in English 20 May 78 pp 8-11

[Text] The last in the series of lectures on problems of pollution and environment, sponsored by the United Nations Environmental Program and presented at the American University of Beirut was given by Professor Afteem Akrah, Chairman of the Environmental Health Program of the AUB Public Health Department. In the lecture which bore the title Marine Pollution Along The Costs Of Lebanon, Professor Akrah outlined the major environmental problems that are faced along Lebanese coasts and reproached the disconcerted attitude of the Lebanese specialised authorities and their failure to search for curative measures for the growing threat which coastal pollution is posing on Lebanese touristic resources. Professor Akrah did not fail to express gratitude and encouragement to the Fight Pollution Club of the American University of Beirut which has made painstaking contributions for the purpose of finding adequate remedies for the unchecked sources of environmental pollution in Lebanon.

Of Value For Tourism

Professor Akrah pointed out the value of protecting Lebanon's coastal fortunes which have always been one of the most seducing of the country's touristic natural beauty resources, but which unfortunately are being currently subjected to all sorts of deformation of which the most obvious is marine pollution.

Professor Akrah's discussion was not confined to Lebanon. Being located on the Mediterranean, Lebanon has had to tolerate the effects of not only the pollutants that are discharged by it but also by many other neighbouring and distant countries in the sea's basin. Few of these countries have actually taken effective measures to cure marine pollution and when taken, Professor Akrah said, the measures were clearly inadequate.

For that reason, Professor Akrah said, many have claimed that the Mediterranean is a dying sea and that within ten to twenty years it will be quite dead. Although there is every reason to believe that, Professor Akrah said, I do not agree to it. In fact, he added, none of this will happen.

Briefly describing the Mediterranean, Professor Akrah said it is, so to speak, an almost closed lake having only three outlets. One of these is at Gibraltar, the other is the Bosphorus and the third is the Suez Canal. This almost closed form of the Mediterranean sea has limited the replacement of its waters. In the three outlets named above, very limited volumes of Mediterranean sea water are replaced with fresh Atlantic Ocean water. When warm Mediterranean water flows out to the Atlantic at the surface and fresh water enters underneath, the discharge of large quantities of pollutants is permitted. The same occurs in other outlets, namely the Suez Canal and the Bosphorus. This discharge, Professor Akrah said, when compared to the estimated volume of pollutants discharged in the Mediterranean in any specified period of time, remains a very slight proportion.

#### Varying Contamination

Different areas of the Mediterranean sea, Professor Akrah said in his lecture, are contaminated in varying degree. The most highly contaminated areas, he said, are the Western shores of the basin (Italy, France, Spain and to some extent Greece). This high degree of contamination, he explained, is the result of discharges of very toxic pollutants by industries in the above mentioned countries.

Any pollutants discharged in the Mediterranean, Professor Akrah said either decomposes or remains undecomposed. Of the latter category of pollutants are plastic products. It will take the Mediterranean more than seventy-five years, he added, to clean itself provided of course that further pollution is checked and no pollutants are discharged anymore.

#### Sources Of Pollution

The causes of marine pollution in the Mediterranean sea, Professor Akrah said, are a) oil tanker spillage and wreckage, b) refuse or waste discharge, and c) sewage discharge. Oil tankers, he said, loading at terminals and unloading in Europe are always expected to spill amounts of oil on the delivery trip. On returning from Europe these same tankers are filled with water to maintain the balance. When the ships approach the terminal which they revisit to load again, the water, called balast water, is discharged at sea and sizable quantities of oil usually flow out of the vessel in the process.

Accidents and tanker wreckage at sea also leads to huge discharges of oil pollutants. Only two months ago, Professor Akrah said, 250 000 tons of oil were discharged with the wreckage of a tanker off the coast of France. If any such wreckage or accident occurs in the Mediterranean, the lecturer said, one can be certain that the sea will be "declared dead" immediately. In fact no country on the Mediterranean is capable of combatting oil spillage problems.

Furthermore, Professor Akrah said, oil spillage can be quite harmful if the oil spilled bacterializes. The bacteria will in effect consume the larger part if not all the oxygen in sea water and marine life will be totally wiped out. Professor Akrah brought back to the minds of his audience the oil spillage which occurred off the Zahrani refinery in South Lebanon in 1962. Traces of tar, which results when oil spills are exposed to sunshine, still persist along sea shores south of Beirut as a reminder of that incident. Tar bores, Professor Akrah said, also accumulate till not along these shores north of Zahrani.

The Chairman of the Environmental Health Program at AUB then revealed results reached by a study of oil residue concentrations in Lebanon's coastal waters from North to South. The degree of concentration in Tripoli's coastal waters was found to be 35 miligrams of oil per litre of sea water, a very high degree of contamination. This degree was recorded close to the Iraq Petroleum Company's refinery and oil terminal in the Northern capital. Further to the North and in the direction of Akkar, concentration of oil in sea water dropped to 25 miligrams per litre. A similar drop in the concentration of oil in sea water was also observed South of Qalamoun reaching Tabarja. The degree of concentration recorded was 10 miligrans of oil per litre.

The concentration rises again, however, along the coasts of Beirut's suburbs and in the Beirut Port harbour waters. The high degree of concentration close to the Beirut Port is mainly the result of the discharge of grease by incoming vessels. Discharged grease is used for vessel propellor maintenance and preservation.

The study referred to reveals that between Damour and Sidon, the degree of concentration of oil in sea water, indicative of the degree of contamination, is fairly low. In fact the coastline between Damour and Sidon was found to be fairly free of pollutants. The most highly bacteriologically contaminated coastline was, according to the findings of the mentioned study, that lying between Beirut and Antelias to the North. Based on the findings of the study conducted by an expert team, Professor Akrah said, it was proposed by many that swimming in that contaminated area be strictly prohibited.

The study also examined seasonal variations in the degree of contamination. It was found that the concentration of oil in sea water is highest in January and February due to greater oil tanker traffic in winter which subsequently leads to more accidental oil spillage. Professor Afteem Akrah then outlined the progress that has been achieved in the Gulf area in the field of sea water protection and anti-pollution drive sponsored and guided by the state authorities in Gulf countries. In view of the greater pollution dangers that Gulf countries stand to face the specialized authorities in them have cooperated and prepared a draft agreement by which Saudi Arabia, Kuwait and Iran will join efforts in case of any oil tanker collision accident or any other event that would pollute Gulf waters.

Immediate cures will be sought by the countries included in the agreement to combat the harmful effects of such incidents. Lebanon, Professor Akrah said, should follow the example of the Gulf countries although the size of pollution dangers that it faces is not as great as those of the Gulf.

Another source of pollution in Lebanese sea water, Mr. Akrah said, is the discharge of refuse (garbage) in the sea. Professor Akrah dwelled on the present state of refuse treatment processes which have been discontinued during the war and were not resumed thereafter. Although a composting plant was mounted with French assistance for the treatment of refuse, the plant was put into operation for three months and soon afterwards the civil disturbances broke out and the plant was heavily damaged. The plant, having an initial overall cost of LL 10 million but actually costing LL 19-20 million was to handle some 200 tons of refuse each day and transform it into soil conditioner after all glass and metal elements in the refuse are sorted out. Starting operation in 1975 and damaged by the fighting, the composting plant needs some LL 5-10 million for repair. No plans to repair that plant are, however, being considered at present.

More than 600 tons of refuse were discharged each day during the past two years, Professor Akrah revealed. This discharge is expected to have increased. Collected refuse continues to be dumped in the Quarantine area North of the Beirut Port. Piles of refuse which Professor Akrah called "Mount Refuse" continue to build up in that area and are every now and then levelled by bulldozers. Adding to the sources of pollution and contamination, the nearby by slaughterhouse discharges liquid wastes, untreated, which with the piles of refuse render the coastal waters in that area the most highly contaminated along the Lebanese coastline. The larger part of these wastes are carried but the current Northwards where they settle on the sea bottom thus preventing the survival of all maritime live species and all marine life that feeds on sea floor weeds. This evidently spoils most of the beach area North of Beirut and as far as Antelias coming close to the coasts of Jounieh.

Apart from the polluting effect of refuse on sea water and marine life, the piling of refuse in the Quarantine area provides ample breeding conditions for rats and flies. The proportion of rats to each person in that area was estimated at around 5 rats/person. For the whole of Beirut, the rat-citizen ratio is estimated at around three rats to each person. Furthermore, scavengers who salvage junk and metal remains from dumped piles of refuse are also seriously exposed to decreases from what has come to constitute a means of livelihood for them; garbage. These are said to earn LL 10 per day from selling salvaged products. Concluding his examination of the effects of refuse piling in the Quarantine area on the sea shore up until Antelias Mr. Akrah said in a distance of 20 metres on that sea shore some 220 rubber tires were found in one collection attempt and various other unidentified wastes most of which are not decomposable.

On possible curative measures for this problem Professor Akrah said there is no point in proposing curative measures as long as we are still dumping. If dumping is to continue then remedies should be continuous to cope up with constant pollution and contamination. Professor Akrah also pointed out the procedure that was followed in refuse treatment during the two year civil war when further dumping was not possible. He said collected refuse was dumped in the Ouza'i area, close to the Beirut International Airport in huge pits that were dug and the sand coming out of them sold without any authorization.

Finally, Professor Akrah dwelled on the third source of marine pollution in Lebanon, namely sewage water. He said more than twelve sewage outlets in Beirut discharge in the sea where spots of distinctly coloured water can often be seen when the sea is calm. Sewage water discharged in the sea is not treated which does not by any chance demerit Lebanon as no other country on the Mediterranean treats sewage water before being discharged in the sea. The danger of sewage pollution is basically due to toxic components in sewage water. In what concerns these toxic elements, they are more abundant in sewage water in other European countries than in Lebanon.

Sewage water and its contents, being dissolvable, finds its way to fish, Mr. Akrah explained, which pose serious dangers of poisoning consumers. He revealed the findings of a study of 282 types of fish found in Lebanese territorial waters for specifying the content of mercury in each of these types of fish. The overall average content of mercury in each fish was found to be 0.076 miligrans. Yet Lebanon, Mr. Akrah said, remains cleaner than other countries of the Mediterranean when it comes to mercury, since given the modest state of our industry, the discharge of industrial wastes are limited. Professor Akrah then revealed the findings of detailed inspection of mercury contents in the various kinds of fish in various areas. Tuna was found to be the most highly contaminated type of fish.

The final remark made by Professor Akrah on the outlook for the future of marine life in Lebanon was that it is not expected that pollution of Lebanon's sea water will come to a halt but a greater and more serious effort to control and treat refuse and waste has started and will surely continue with more enthusiasm.

CSO: 5000

## IVORY COAST

### CONSTANT DECLINE IN ANNUAL RAINFALL NOTED

Abidjan FRATERNITE-MATIN in French 3-4 May 78 p 16

[Article by Benita Ahossy: "Constant Decline in Rainfall for the Past 15 Years"]

[Text] "We will know a great deal more about the climate of the Ivory Coast from now on." The words were spoken by Bahi Zahiri, a representative of the Agency for the Safety of Aerial Navigation in Africa and Madagascar (ASECNA), at the end of the "six-day national conference" organized in Bouake on 27 and 28 April.

The papers given at the conference discussed meteorology in the Ivory Coast and the climate developments for the last 15 years. At the opening of the conference, Bahi established new goals for the study of climate, which must henceforth provide more than a daily forecast. "Meteorology must treat all the problems that it encounters and may conceivably help to resolve." For example, planters, industrialists, sailors, etc., could all profit from an expanded study of meteorology.

Mr Leroux, director of the cabinet in the local department and a representative of the Ministry of Scientific Research, summed up the meetings. "What have we been talking about these last few days?" "Air, water, sun, in short, climate on the whole."

### Constant Deficit

Although there are other important elements, water is of primary significance in Africa these days. The Sahel region has been affected by scarcity or lack of water. Since 1964 the Ivory Coast has suffered a constant decrease in the amount of rainfall. During this long period, 1968 was the only year in which there was any excess of rain.

In the course of the six days of the national conference, Mr Cissoko, head of the main meteorological center in Abidjan, noted four areas which are experiencing deficits:

--The coast and back-country between Jacqueville and the Ghana Border, Cissoko pointed out that the total deficit in the Abidjan region is on the order of 2,000 mm, more than 5,000 mm in the southeast (Aboisso region);

--The coast west of San Pedro and the forest lands from Divo to Grabo and Soubre, here the shortage is greater than 2,000 mm around Grabo and 1,500 in the coastal area of Tabou;

--The mountainous region in the west including the triangle made by Touba, Seguela and Toulepleu has not been spared;

--The far north (Tingrela) and northeast (around the axis of Ouangolo Fitini, Dabakala, Katiola), the shortage in this region and in the mountainous region is about 2,000 mm.

However, Cissoko indicated that the deficits are not as severe in the northwest or in the Daloa, Guiglo area.

The occurrence of drought is not surprising in the northern regions of our country because of the proximity of the Sahel. However, it is hard to understand the decline in rainfall noted in the forest regions of the south and west.

Some experts see this scarcity as a logical consequence of recently established large-scale agriculture. They argue that forest vegetation attracts clouds and that the destruction of forest lands causes drought.

Water was also the topic of a report entitled "Adjustment of Vegetation Cycles," by Coulibaly Abdoulaye, head of the agro-climatology division of ASECNA's meteorological service. In essence, the paper says that growth cycles may be adjusted in an attempt to find the season which best satisfies the plant's need for water.

The problems of the farmer will center around the question of water supplies in the future, if it does not already. The need for water varies with the crop. In order to obtain maximum production it is necessary to know the optimum planting season for each crop.

The climate is fluctuating, seasonal weather is unpredictable and the rains do not come at the same time each year. By adhering to their traditional planting customs, the farmer is compromising the success of hard and patient efforts.

The results of research on the climate of the Ivory Coast must be accessible to rural areas where the essential force of our economy is located.

Furthermore, Bahi stated that, "The participants of this conference must be concerned with presenting the results of their research in the popularized form suggested by the Ministry of Agriculture and recommended by the Ministry of Scientific Research."

## Assistance

As it serves aviation, ASECNA has access to statistics on atmospheric conditions which would be helpful in various economic sectors. Also, the FAO has suggested that a climate control program might help the world-wide need to improve food production.

"From now on, everyone will share the meteorologist's interest in climate," says Leroux. Promoters of tourism, tourists themselves, businessmen, travelers, everyone will want to know the weather in a specific country before planning a trip.

Wind movement is also significant for the agricultural geneticist. When wind is found to be responsible for crop damage in grain fields, we are led to think in terms of the hardiness of the species planted.

They are certainly enough reasons to affirm the multidimensional aspects of meteorology.

ASECNA is aware of the major role it will play in future years, training people and acquiring the newest equipment.

With this in mind, Desire Boni, Minister of Public Works, Transportation, Construction and Urban Life, opened the "six-day national conference" with some thoughts about the technical training our countrymen will need. "There is a need to develop specialists, forecasters, observers, climatologists, water and agricultural engineers, in order to use these disciplines to their fullest extent in the context of economic growth.

Mr Djigbenou, in an account of ASECNA activities, writes that on the spot training of special agents is currently part of regular inspections. Personnel specializing in observation are regularly trained at the professional training center in the Ministry of Public Works.

## The Best Possible Use

Finally, air, water and sun, the components of climate are integral parts of all existence. On these grounds, it is essential to improve our mastery of the climate and make the best possible use of the weather.

Furthermore, meetings, such as the one held in Bouake, which bring together eminent scientists, are quite promising, even though researchers from ASECNA and other institutes claim that they cannot make it rain.

Nevertheless, the data they collect will aid in making decisions about important future projects. The statistics will guide us prudently as we assess a project and decide whether it is potentially successful or simply not feasible.

---

The "six-day national conference" on climatology was held in the luxurious rooms of the Hotel Harmattan in Bouake. The conference was presided over by Desire Boni, Minister of Public Works, Transportation, Construction and Urban Life. He was assisted by Mayor Djibo Sounkalo and Commissioner Leon K. Koffi, both of Bouake.

9161  
CSO: 5000

USSR

SUPREME SOVIET BODIES APPROVE CONVENTION ON USE OF ENVIRONMENT

LD121806Y Moscow TASS in English 1745 GMT 12 May 78 LD

[Text] Moscow, May 12, TASS--The Foreign Affairs Commissions of the Soviet of the Union and the Soviet of Nationalities--two houses of the Supreme Soviet of the USSR--unanimously approved today at a joint meeting in the Kremlin the convention of the prohibition of action to influence the environment for military and other hostile purposes. In the adopted conclusion they recommended the Presidium of the Supreme Soviet of the USSR to ratify the convention. Taking the floor at the meeting, Georgiy Korniyenko, first deputy minister of foreign affairs of the USSR, said: The importance and urgency of the solution of this problem was dictated by the fact that an ever growing number of states is being involved now in research to modify the processes occurring in nature and linked with possible changes of the climate and other geophysical phenomena. The conclusion of this convention is yet another important step called upon to block a whole trend in the possible development of new methods of warfare, to deliver the present and future generations of the danger arising from a brutal destruction of the natural environment in which human civilization is developing.

Boris Ponomarev, chairman of the Foreign Affairs Commission of the Soviet of Nationalities, said in his speech: "The policy of the Soviet state is aimed at blocking all the channels of the arms race, at stopping, on the one hand, the stockpiling of the already existing types of weapons, and then going over to their reduction, on the other, at preventing the development of new, yet uninvented weapons. This is why the Soviet Union, together with other peace-loving forces, is making active efforts to prevent the creation of a new, particularly inhuman means of annihilation--the neutron weapon. This is why the Soviet Union has also come out as the initiator of the international agreement on the prohibition of action to influence the environment for military or other hostile purposes, regarding it as an important element in the struggle to end the arms race. There are serious grounds for fear, Boris Ponomarev stressed, that methods of influencing the weather and geophysical processes might be used also for destructive military purposes harming the wellbeing and health of human beings. According to press reports, during the aggression against Vietnam special operations were carried out for several years over the territories of the Indochina states to cause or intensify rains artificially by "impregnating" the clouds. This was done to flood certain areas of Indochina, destroy roads, dams and river crossings.

There are real possibilities for implementing several other methods of influencing the environment and the climate for military purposes, Boris Ponomarev noted. Press reports mention the possibility of influencing the ozone layer in the upper sections of the atmosphere to intensify the penetration of ultra-violet radiation over these or other areas of the earth's surface, which would gravely harm human and all other living beings. Understandable and timely therefore is the considered convention, Ponomarev said. Its signatories commit themselves not to resort to the military or any other hostile use of means to influence the environment. On the other hand, the convention does not prevent the modification of nature for peaceful purposes. It will promote the development of international cooperation in this sphere.

Discussion of the convention on the prohibition of action to influence the environment in military and other hostile purposes has shown, in the opinion of the Foreign Affairs Commissions of both houses of the Supreme Soviet of the USSR, that its ratification and entry into force will be an important factor of improving the international climate, will serve to deepen the detente, will contribute to the cause of ridding mankind of the danger of the use of new types and systems of weapons, to the curbing of the arms race.

Boris Ponomarev expressed the hope that the parliaments of other countries would ratify the convention shortly, that the U.S. Congress, too, would do this without delay.

CSO: 5000

USSR

## ENFORCING ENVIRONMENTAL PROTECTION LAWS

Moscow SOTSIALISTICHESKAYA ZAKONNOST' in Russian No 3, Mar 78  
pp 16-19

Article by N. Mikhno, prosecutor, department for general supervision, RSFSR Public Prosecutor's Office: "Increase the Effectiveness of the Prosecutor's Supervision over Enforcement of Environmental Protection Laws" /

Text It is written in article 18 of the USSR Constitution that it is necessary to protect our homeland's natural resources in every way possible and to use them efficiently by seeing to it that they are renewed and expanded. It is the constitutional duty of each Soviet citizen to observe the laws on environmental protection. Proceeding from the requirements of the USSR Constitution, the prosecutor's supervision over enforcement of environmental protection laws must be strengthened.

What possibilities are at the disposal of the prosecutor for increasing supervision, and in the first place general supervision, over the enforcement of legislation on environmental protection?

A number of monitoring agencies are verifying the enforcement of laws and decrees of the highest governmental bodies and administrations and the enforcement of acts on environmental protection which are subsidiary to the laws. Increasing the level of the prosecutor's supervision does not mean increasing the number of general supervisory inspections at enterprises, management agencies and economic organizations; it means increasing attention toward supervising the observance of the rule of law in the activities of those state management agencies whose duty it is first and foremost to organize enforcement of the laws and to monitor their execution. Trying to achieve, by means of the prosecutor's supervisory power, a situation where these agencies are fulfilling the duties as-

signed to them for monitoring and ensuring that the activities of enterprises, organizations, institutions and their officials as well as the conduct of citizens are in compliance with the law--this is one of the realistic and most effective ways for the public prosecutor's office to achieve its goals in this area.

As practical experience testifies, many prosecutors are conducting this kind of supervision on a regular basis.

After drawing together the notifications which were received on violations of hunting regulations, the Kaluzhskaya Oblast Public Prosecutor's Office came to the conclusion that a serious campaign against poaching was not being conducted in the oblast. Then, they conducted an inspection of the hunting inspection board of the oblast soviet's ispolkom; it unearthed serious legal infractions in the inspection board's activities. The number of violations of hunting regulations had increased from year to year. However, inspection board officials were not making full use of the rights granted them by law to bring administrative and pecuniary action against the violators; they were frequently lenient with the poachers and they were violating established procedures for imposing fines on guilty parties and for reviewing citizens' requests and complaints. Based on the results of the inspection, the oblast prosecutor tabled a motion at the oblast soviet's ispolkom; it demanded that administrative action be taken against the chief hunting inspector and that measures be taken to eliminate the legal infractions. The ispolkom adopted a decision which made it incumbent upon the inspection board to increase its campaign against poachers and to ensure strict observance of the laws in its own activities; it imposed administrative punishment on the chief inspector. The ispolkoms of rayon and city soviets were ordered to increase their supervision over the work of local hunters and hunting and fishing associations and to listen to reports on their work on a systematic basis. Enforcement of the decision adopted is being monitored. The campaign against violators of hunting regulations and poachers was noticeably sped up in the oblast after this.

The exercise of supervisory power over environmental protection agencies' compliance with the law has its own special features and pitfalls. Therefore, it is necessary to have a precise understanding of their jurisdictions, specifically the exclusively legal nature of the prosecutor's supervisory power, so the activities of monitoring agencies are not replaced by the prosecutor's supervisory power. A violation of the law is

the only grounds for prosecutors to use the authority granted them by law.

Prosecutor inspections attest to the fact that state agencies which are monitoring the observance of legislation on environmental protection are frequently committing serious legal infractions. The following can be cited as the most characteristic: a lack of timeliness in uncovering violations of the law and the guilty parties; not employing all their powers of suasion on guilty officials and citizens; not ensuring complete recovery from violators of amounts for fines which were imposed and for material damages which were caused by them; material on flagrant violations of environmental protection laws--which divulge the facts of a crime--is not always being transmitted to investigative agencies. Many legal infractions are committed by the administrative commissions of rayon and city soviets: cases on offenses are held too long by them or they are not reviewed at all; an easy-going attitude is frequently displayed toward violators; there is a lack of control over the actual enforcement of authoritative administrative measures taken against guilty parties. The prosecutors are also not always taking the measures required for combatting legal infractions in the activities of environmental protection agencies.

The law specifically makes it incumbent upon environmental protection agencies and their officials, who carry out decrees which impose fines, to monitor their timely recovery. However, the violator sometimes evades voluntary payment of a fine and the administration or accounting department of the enterprise (organization), where the violator works and where the decree was sent to have the fine incontestably deducted from his wages, fails to take any action and sometimes engages in unquestionable deception. In such cases, the monitoring agency turns to the public prosecutor's office for assistance in enforcing their decree which imposed the fine. Cases are known where the public prosecutor's office did not react to these appeals in the proper manner and did not take measures to recover the fine and punish the enterprise (organization) officials who were not carrying out their official duties. As a rule, they justified their position by the fact that this supposedly was not included within the functions of the prosecutor's supervisory power. Whereas the act of the enterprise managers and accounting employees in evading the deduction of fines which were imposed is a violation of the law, prosecutors, when notified of it, must try to eliminate the violations, specifically by bringing the charges before higher agencies.

It also happens that monitoring agencies turn to the public prosecutor's office on a given issue after the expiration of the three-month statute of limitations established by law for enforcing a decree which imposes an administrative penalty, or not having used all the powers granted to them for recovering the fine. Prosecutors who take measures to eliminate the inactivity of monitoring agencies and their officials are acting properly.

For the purpose of increasing the effectiveness of the prosecutor's supervision over the enforcement of environmental protection laws, prosecutors must constantly improve communication with monitoring agencies.

In their practice, the public prosecutor's offices of the Bashkirskaya ASSR, Khabarovskiy Kray, Irkutskaya, Omskaya and Saratovskaya oblasts and others are employing diverse methods of communication with monitoring agencies, including those which have tasks for environmental protection: a mutual exchange of information on offenses committed at particular facilities, at a group of related facilities or within the confines of an administrative-territorial unit; periodic meetings of officials from the public prosecutor's office and monitoring agencies to exchange opinions on measures for combatting legal infractions; participation of representatives from the public prosecutor's office in meetings, seminars and applied scientific conferences conducted by environmental protection agencies, and the converse, enlisting officials from monitoring agencies to participate in prosecutor inspections, coordination of arrangements for conducting legal propaganda and others.

The Saratovskaya Oblast Public Prosecutor's Office conducted a meeting--on cooperation between the oblast's administrative and environmental protection agencies to ensure protection of the environment in light of the decisions of the 25th CPSU Congress--for managers of the oblast's environmental protection and administrative agencies. The oblast deputy prosecutor's report and the speeches of the managers of the monitoring agencies pointed out the shortcomings which were being tolerated in monitoring and supervising enforcement of environmental protection laws. After suggesting that similar meetings be held in localities, the meeting recommended that the management of the public prosecutor's office and the AIA [Administration for Internal Affairs] of the oblast soviet's ispolkom prepare a newsletter for the prosecutors and chiefs of internal affairs departments of the oblast's rayons and cities on the need to increase supervision and monitoring of the enforcement of legislation on environmental protection.

Prosecutors were given the power to request the necessary documents and information from the executives of ministries, departments, institutions, enterprises, executive and supervisory agencies of local soviets and from officials. This provision of the law relates equally to information uncovered by monitoring agencies on violations of environmental protection laws and to measures taken on the violations. The public prosecutor's offices of Kurskaya and Lipetskaya oblasts have already accumulated some positive experience in this area.

Another condition which influences the effectiveness of the prosecutor's supervisory power is proper planning and conduct of in-depth inspections of law enforcement in localities and a strong reaction to the violations which are discovered. Statistical data for last year show that charges were only brought for one-third of the prosecutor inspections on enforcement of environmental protection laws. It was even less in the public prosecutor's offices of the North Osetinskaya ASSR, Altayskiy and Krasnoyarskiy krays and Gor'kovskaya and Tomskaya oblasts.

But compiling a work plan and conducting inspections are not ends in themselves. Therefore, when evaluating the quality of a plan, it is necessary to consider whether the planned measures proceed from a state of compliance with the law and to what extent they meet the interests of strengthening the rule of law at those facilities where violations are most prevalent or where they are most dangerous to society.

Without the help of specialists, the prosecutor is frequently unable to uncover--completely and in-depth--the circumstances which contribute to violations of the laws. Specialists are able to give advice on the specifics in the activities of facilities where a general supervisory inspection is being conducted; they can help uncover information on violations of the laws and the circumstances which are contributing to them; at the request of the prosecutor, they can conduct an inspection when it is beyond the bounds of his competence; based on the results of such an inspection, they can prepare a memorandum on the offenses uncovered, the guilty parties who committed them, the circumstances which contributed to them and the measures which should be taken.\*

Here is an example of the effective use of specialists. The Zheleznodorozhnyy Rayon Public Prosecutor's Office of the city of Khabarovsk received a report that the Khabarovsk Airport

---

\*See V. Bulgarin and V. Melkumov, "Using Specialists in a Prosecutor's Inspection," SOTSIALISTICHESKAYA ZAKONNOST', 1972, No 8, pp 33-35.

was polluting neighboring bodies of water with untreated industrial and household sewage. The ispolkom of the rayon soviet also received similar complaints. The rayon prosecutor decided to check enforcement of the laws on the campaign against water pollution not only at the airport but also at other industrial enterprises. For the inspection, he recruited specialists from the Amur River Basin (Territorial) Administration for Regulating the Use and Conservation of Water, from the city and rayon sanitary epidemiologic stations and from the rayon council of the environmental protection association. With their assistance, they determined the enterprises which needed an inspection and the range of issues which should be looked into. During the inspection, it was established that the airport and a number of enterprises were discharging a large quantity of untreated sewage into the water; purification installations at several enterprises were either completely lacking or they were not working satisfactorily and the managers of these enterprises and organizations had not taken measures to correct the state of affairs.

Based on the results of the inspection, the prosecutor introduced an exhibit at the ispolkom of the rayon soviet; it analyzed the violations of the environmental protection laws in the rayon, cited the causes of the offenses which were uncovered and specifically pointed out the irresponsibility of a number of economic managers in observing the laws on protection of bodies of water. The ispolkom put the issue raised by the prosecutor before a session of the soviet and it adopted a decision directed at eliminating the legal infractions and ensuring the cleanliness of bodies of water. Disciplinary measures were taken against the guilty parties and they were held pecuniarily liable. The prosecutor published an article based on the inspection results in the kray newspaper TIKHO-OKEANSKAYA ZVEZDA. The Khabarovskiy Kray Public Prosecutor's Office summarized and disseminated the Zhelezdorozhnyy Rayon Public Prosecutor's Office's positive experience in supervising the enforcement of environmental protection laws.

While carrying out the decisions of the party and government, the Russian Federation Public Prosecutor's Office has strengthened its supervision over observance of legislation on environmental protection. However, the effectiveness of prosecutors' measures is still not always great and the required campaign against water and air pollution and against a wasteful attitude toward natural resources is not being conducted in a number of places. Considering the exceptional importance of the issues on environmental protection and on efficient utilization of natural resources, the USSR Public Prosecutor's Office pointed out the need for further strengthening super-

vision over the enforcement of legislation on environmental protection. The goal was set to strive to eliminate all violations uncovered and to eliminate the causes which contributed to them and to bring action against guilty parties.

CCOPYRIGHT: "Sotsialisticheskaya zakonnost'", 1978

9001  
CSO: 5000

USSR

## ENVIRONMENTAL PROTECTION IN MOSCOW

Moscow MOSKOVSKAYA PRAVDA in Russian 7 Mar 78 p 2

[Article by A. Biryukov, head of Glavmosinzhstroy: "Nature and the City"]

[Text] The builders of Glavmosinzhstroy are increasing the tempos of work related to environmental protection.

Our state has raised concern for environmental protection to a constitutional principle. In Moscow with each year the output and tempo are increasing for the construction of engineering structures which guarantee the putting into practice of the statutes of articles 18 and 42 of the Basic Law. The collective of the Glavmosinzhstroy is building and renovating plants for aeration and sewer systems, and treatment works at the major enterprises and at the plants of their own production base.

Today our city consumes 5 million cubic meters of water per day. There are 650 liters for each Muscovite. Naturally the need also increases for treatment of waste waters.

The first phase has been put into operation and construction is being completed on the second phase of the Novo-Kur'yanovskiy aeration plant. The second Novo-Lyuberetskiy aeration plant is being erected. Large sewer systems have been put into operation--Cherkizovskiy, Likhoborskiy, Zapadniy and Yuzhniy. Thus the total output of the facilities has reached 5 million cubic meters per day.

Note that as many cities consume water, that many also purify it. Consequently, now only treated effluence enters the reservoirs. Such a balance has been reached in our capital for the first time in the world. Further construction of aeration plants will improve the quality of the treatment of waste waters discharged into the Moscow River and other reservoirs.

The socialist commitment accepted by the collective of the central board for the construction of the Novo-Kur'yanovskiy aeration plant in 1977 has been successfully fulfilled. Construction has been completed of the first phase of the second block for complete purification of 500,000 cubic meters of

waste water per day. With a plan of 2.5 million rubles over 4 million have been allocated. Facilities for comprehensive treatment of residue are being constructed ahead of schedule at the Lyubinskiy and Lyuberetskiy aeration plants.

A large amount of work has been done in Zelenograd. Here the country's highest degree of waste water purification has been reached. The program for the construction of group treatment works has been overfulfilled in the industrial zone of "Kolomenskoye" and the Ostapovskiy passage. The work done by the builders has favorably reflected on the sanitation condition of the city, having significantly improved it. It should, however, be acknowledged that the builders are not successful at all the sites. In 1978 we will try to compensate for omissions.

Treatment facilities have been constructed at nearly all the enterprises of the central board. We are giving special attention to dust and gas trapping at the asphalt concrete plants. Efficient units have been installed and are operating. Annually over 10 million rubles are appropriated by the central board for the construction of treatment facilities. In our opinion it is necessary for the enterprises of the ministries and departments also to construct them with their own forces. Only thus, we believe, can the problem of purification of torrential and industrial effluence be solved in a short time.

So that the construction of treatment facilities in the city would truly become a mass phenomenon the planning organizations of the GlavAPU [Main Architectural Planning Administration of the City of Moscow] have to increase the industriousness of their work. The builders need standard solutions, and simpler and less expensive designs than now. We are waiting for the Glavmospromstroymaterialov [Main Administration of the Building Materials and Structural Parts Industry of the Mosgorispolkom] and the Glavmosmontazh-spetsstroy [Main Administration for Special Installation Work] to set up complete output of items, structural parts, and equipment.

The role of vegetation planting is great in the life of the capital. In recent years in the city new squares have been marked off, trees and bushes have been planted along the main highways, and wide grass plots have been set up.

They need to be preserved, in the first place by abandoning the use of chlorides for softening ice and packed snow. Salts falling onto the grass penetrate the soil to the roots of the trees and destroy them. The administration of roads and public welfare of the Mosgorispolkom is faced with finding a way out of the existing situation.

The problem of cleaning the streets, yards and sidewalks of snow should be solved immediately. Now it is thrown together with the rubbish and dirt into the river. There is another method which is more economical and guarantees

that purified snow is discharged into the reservoirs. Its essence is that around the collector pits on the city streets grills are installed through which the snow falls into the underground channels, the snow melt water enters the treatment facilities, and only then is discharged into the rivers.

The Glavmosinzhstroy jointly with the institute "Mosinzhproyekt" have made calculations which substantiate the technical and economic efficiency of snow melting according to the active collectors. Special snow reception chambers have been built. Their experimental operation confirms the viability of the idea.

Taking into account that the output of the sewer systems and treatment facilities in recent years has sharply increased the administrations of water and sewage and public welfare of the Mosgorispolkom [Executive Committee of the Moscow City Soviet of Workers' Deputies], and the technical administration of the Mossovet [Moscow City Soviet of Workers' Deputies] have the power to guarantee the practical realization of the idea of snow melting.

Purity of air in the city is largely promoted by the construction of major highways in combination with underground pedestrian passages, transport intersections, and grass plots. Reduction in the number of crossings and correspondingly the number of stops sharply decreases the discharge of exhaust into the atmosphere. Only in recent years our collective has built and put into operation important highways: the Varshavskiy, Altuf'yevskiy and Shchelkovskiy highways, a section of the Novokirovskiy boulevard, and others. In the Tenth Five-Year Plan we will build 50 underground passages.

At the same time the construction of transportation tunnels has practically ceased. Less and less capital is allocated from year to year for road construction. Apparently we jointly with the Mosgorplan [Moscow City Planning Commission] should take more energetic measures to increase the capital investments in road and transportation construction.

There are other problems as well. We are preparing for the construction of deeply laid sewers, and are practically ready for this work. Now the technology is being refined, and the machines and mechanisms are being selected. Construction at great depths will permit collectors of large diameters to be built and by the shortest means in a fundamental way the system of removing domestic and industrial effluence to be improved.

However the planning organizations of the GlavAPU are delaying the development of the technical and economic base. The long-range loads are not always taken into account in the planning of sewers. Counting errors result in the fact that within several years after the end of construction the sewer is increased, that is alongside, as a rule in the zone of active pipelines a new one is laid. This happened on the routes laid from the Cherkizovskiy to the Filevskiy pumping stations, and the Oktyabr'skiy northern and Yugo-Zapadnyy channels. From here follows the unjustified expenditure of capital investments and unproductive use of the plants of the construction organizations.

We are trying to begin work in new regions of mass housing systems before house building brigades arrive there. The advance building of engineering structures, as is known, creates the optimal conditions for the smooth and complex putting into operation of housing and other targets. However the GlavAPU and GlavUKS are delaying the distribution of the design documents which have been agreed upon by the interested organizations. Now such a situation has developed in Strogina.

Having removed the listed problems from the agenda by the efforts of all the interested sides we will give our remarkable city clean air, clear water and much, much green.

9035

CSO: 5000

USSR

## ENVIRONMENTAL PROTECTION MEASURES

Moscow EKONOMICHESKAYA GAZETA in Russian No 20, May 78 p 19

[Article by A. Tsygankov, deputy chief of the Department of Natural Utilization and Protection of the Natural Environment of the State Committee for Science and Technology: "Special Purpose Programs In Action"]

[Text] In 1976 a change from coordinated plans to scientific and technical programs was implemented for increased scientific research effectiveness in the field of protection and the efficient use of natural resources. Scientific research and planning-design organizations of various ministries were assigned to create specific new devices or new technological solutions with their introduction at certain industrial facilities.

All programs are interbranch in character. Every ministry has been assigned a specific purpose and well-defined schedules and funding. Achieving the final aim depends on the solution of this task. In the preparation process all programs on the protection and efficient use of natural resources were analyzed jointly with the USSR State Planning Committee in order to guarantee the necessary investments for experimental and experimental-production devices.

The programs were aimed at achieving the following basic goals: the development of methods for the efficient use of water resources including an account of the proposed transfer of a portion of the effluents of the northern rivers in the southern regions of the country; the development of new methods, equipment and materials for the purification of sewage and natural waters, gas and dust discards, and for the utilization and reprocessing of by-products; the development of devices and systems to observe and control the condition of the environment; the establishment of scientifically augmented systematic fundamentals for standardization, forecasting environmental conditions over a lengthy period, etc.

Tasks on decreasing the harmful influence of industrial waste on the environment are also included in programs to improve technology in the leading branches of industry including the chemical, petrochemical, oil refining, ferrous and non-ferrous metallurgy, power engineering and others.

Planning in the form of specific programs proves its value. Scientific research work is being conducted to create sewageless water supply systems for the Tobol'skiy petro-chemical complex, the Krasnodarskiy combine of biochemical and vitamin preparations of the Ministry of the Medical Industry, and the Kalushkoye association Khlorvinil of the Ministry of the Chemical Industry. The introduction of these is planned for the end of the five-year plan. The experience derived will be used for planning similar systems even in other branches of industry. Based on Practices already available, the first version of the systematic instructions to establish sewageless water supply systems for industrial enterprises has been developed. After modifications with branch ministries they will be recommended to planning organizations.

With regards to protecting the atmosphere one can note the practices of the nickel enterprises of the USSR Ministry of Non-Ferrous Metallurgy where highly effective processes have been worked out to cleanse gases from ferro-nickel converters. This has brought about a sharp decrease in the discarding of dust into the atmosphere. Recommendations have been issued to modernize gas purification systems for the coking ovens of the Achinskiy aluminum oxide combine. In addition to eliminating waste this provides an appreciable economic effect by returning trapped products to industry.

To utilize and reprocess used casings our country is conducting research on the first experimental device where technical carbon as well as liquid and gasified hydrocarbons are obtained. Further refinements to this process on experimental-production devices will allow for solving one of the most important problems in the field of utilization of solid waste.

To solve the large task of redistribution of water resources scientific research organizations of various ministries and the USSR Academy of Sciences, as specified at the 25th CPSU Congress, are working on the basic conditions of a technical and economic substantiation for transferring a part of the effluents of the northern and Siberian rivers in Central Asia, Kazakhstan, and the southern regions of the European portion of the country.

The programs are improving without interruption. For example, in the task to develop new methods and equipment to utilize waste products, additional themes were introduced to establish economic methods to evaluate the effectiveness of reprocessing by-products and to research the sanitary and hygienic influence on natural and biological resources. This task has acquired a completely logical conclusion.

To more widely involve secondary material resources as represented by industrial waste, the State Committee for Science and Technology jointly with the ministries embarked on establishing a special program, the realization of which will permit not only decreasing the harmful effect of waste products on nature, but will provide an appreciable savings of natural resources. For example, the effect of full utilization of ashes and slag from thermal power stations will amount to almost 400 billion rubles. This great advantage promises the complete use of the slag from ferrous metallurgy, phosphor containing slag from the chemical industry and other by-products.

At the same time the change to these programs has shown that in several instances branch isolation is an impediment to implementation. In particular, the USSR Ministry of the Fish Industry has refused for the second year to allocate 15-20,000 rubles to its subordinate State Planning Institute of the Fishing Fleet to develop an ice producer intended to process the residue from municipal sewage. Correspondence on the matter of this amount continues even now.

According to one of the programs the maritime fleet must receive modern devices to purify the sewage from ships. The question rests on the production of a special pump without which the devices are no more than a lifeless collection of metal. The Ministry of the Shipbuilding Industry feels that the pump should be made by the Ministry of Chemical Machine Building since that ministry has a special main administration that works on the production of pumps. The Ministry of Chemical Machine Building thinks that pumps used for maritime purposes must be manufactured at plants of the Ministry of the Shipbuilding Industry. The Baltic and Black seas are indifferent as to who makes the pumps. One would like to believe that taking this simple truth into account the ministries will nevertheless guarantee the manufacture of the first shipment of pumps.

In the course of scientific research work to set up a water reversible cycle for the Tobol'skiy petrochemical complex currently under construction, a lengthy one year pause took place because the Voronezhskiy branch of the All-Union Scientific Research Institute for Synthetic Rubber was less responsible than required when it approached determining the make up of a simulated solution in order to work off the operating schedules of purification.

Scientific research organizations are sometimes unsuccessful in preparing sufficient documentation for a transfer to experimental design work. For example, such was the case with the development of devices to determine the concentrations of hydrogen fluride in the atmosphere. Of course, there were substantive difficulties but the matter might have been moved along more quickly.

As before it is not clear who is to adjust the series output of linear electron accelerators developed by the Siberian branch of the USSR Academy of Sciences. At the same time there are delays in the creation of devices to reprocess worn out casings and in the introduction of recyclable water systems such as the one installed at the Pervomaysk chemical combine where, with the aid of accelerators, sewage water residue is processed. I think that series production of linear electron accelerators might be completely undertaken by the Ministry of the Electrotechnical Industry.

An important condition for carrying out these programs is the timely putting into operation of experimental-production devices. I think that annual capital investment plans must proceed independently. Incidentally, there are no objections to this from either the enterprises and associations, nor from the ministries.

MINSK OFFICIAL OUTLINES POLLUTION CONTROL PROGRAM

Moscow IZVESTIYA in Russian 19 Apr 78 p 2

[Article by S. Lukashevich, chairman of the ispolkom of the Minsk City Soviet of People's Deputies: "A Feeling of Mastery"]

[Text] Our Minsk is rapidly growing. It is rising up and spreading out. The program for the development of the republic's capital requires fundamental improvements in the organization of work to protect the environment. This involves creating optimal conditions of labor, life and recreation.

These problems are regularly examined at meetings of the ispolkom of the city soviet. The ispolkoms of the rayon soviets in the city and their permanent commissions also give them great attention. Our main requirement is that such problems be handled in a comprehensive manner. In order to do this the Minsk Gorkom of the Belorussian Communist Party and the ispolkom of the soviet of people's deputies have developed an integrated plan of measures to strengthen the protection and improvement of the environment. It was ratified at a meeting of party-economic activists of the city and approved by Central Committee of the Belorussian Communist Party and the republic council of ministers. It sets specific goals for the use of resources, the construction of pollution control installations and the organization of services for monitoring the state of the environment and for the coordination of the activities of these services.

The purity of the air is an object of special concern to soviet organs. There is a special commission operating at the gorispolkom which consists of noted scientists, specialists from the largest enterprises, and workers from the hydrometeorological service. It frequently visits plants and factories and checks the fulfillment of measures to protect the air.

We have developed a long range program for improving the environment and preventing negative effects of industrial, municipal and thermal power engineering enterprises and motor vehicle transportation. Scientists and specialists have determined the extent of air pollution and outlined effective measures to reduce it. In particular, the two stage burning of mazut and the recirculation of smoke gases in rayon boilers and thermal electrical centers has already been introduced. Small, low output boilers have been closed. These facilities have now been converted to centralized heat

supply. The industrial and motor transportation which are the most "dirty" from a sanitation point of view will be moved outside the city. The maximum permissible emission of harmful gases has been determined for each of the remaining enterprises of ministries and departments. The ispolkoms of city and rayon soviets of people's deputies and commissions or the conservation of nature are attentively watching to see that these requirements are observed. Finally, at the suggestion of the deputies, general city courses for improving the qualifications of engineering and technical workers engaged in air pollution control problems have been organized.

As is known, motor vehicle transportation remains the basic source of air pollution. This is not only because the number of vehicles in the city is growing from year to year. There are also other circumstances here which cannot be tolerated. For example, according to data from workers at the state motor vehicle inspectorate, almost half of the buses and trucks go out onto the streets of Minsk without pollution control equipment on their engines. We have initiated a set of measures to eliminate this. They include improving the quality of engine service and repair, control over the conditions at facilities for storing and delivering fuel and lubricants and forbidding the operation of bus engines at terminals and parking sites.

Posts and lines for diagnosing the technical condition of motor vehicles have been set up at large vehicle enterprises. In the immediate future five to ten mobile posts for monitoring the toxicity of exhaust gases will be set up. It is assumed that these and other measures will considerably reduce air pollution by motor vehicles.

The struggle against noise has improved recently. This is one of the most difficult problems. In order to coordinate work to reduce noise an inter-departmental commission has been set up at the ispolkom. The Belorussian Scientific Research Sanitation-Hygiene Institute has compiled a noise map of Minsk and worked out the appropriate recommendations. In particular, it is planned to re-examine the plan for the high density movement of traffic, especially transit and freight. The most "noisy" elements will be moved outside of the city. A decision has been reached on the question of constructing additional bypasses and ring routes and the doubling of street widths. In the construction and reconstruction of residential regions and microregions special measures for protection from noise are planned.

Problems involving the Minsk watershed have caused us considerable concern. The Svisloch' does not have much water and is in no condition to even satisfy a small share of urban needs. Minsk is primarily supplied by water from underground sources. Therefore, reserves of underground and river water must be used very economically. However, the careful use of water has still not become a rule for all managers of organizations and enterprises. Only a few of them have a really conservation minded attitude towards this. For example, we are always trying to disseminate the exper-

ience of the bearing plant, where with the assistance of scientists from the Belorussian Academy of Sciences the nation's first new highly efficient method for treating industrial waters was introduced. The enterprise has practically eliminated the discharge of waste waters into the river and has started to recycle the water for its own process needs. It costs from two thirds to a half as much as industrial water and one half to one fourth as much as water coming from the city system. How many other enterprises in the city have introduced this progressive method? As they say, one, two, and that's all.

A basic system for industrial process water supply to industrial enterprises has been outlined in Minsk. The main source is the Vileysko-Minsk water system. It supplies water for the industrial and domestic needs of the city and permits the central utilization of artesian sources. The gorispolkom has also determined five zones for building water supply facilities. All city enterprises are "attached" to these zones, and the main builders and relative participation in each facility has been determined. The implementation of these measures, very important for the rational distribution and use of water, is under the constant control of the gorispolkom, rayispolkoms, and permanent commissions for the conservation of nature. However, things are still moving slowly.

What is the reason for this? The enterprises about which we are talking are under national subordination. Some of their managers do not always promptly implement the decisions of the ispolkom of the city soviet of people's deputies. It is, they say, simpler to pay the fine than to engage in this work. They pay, of course, not from their own pocket, but from that of the state. Last year alone enterprises in the city used about three million cubic meters of water more than their limit. For this they had to pay more than 600,000 rubles in fines. For example, the Plant imeni Kirov used twice as much water in a month as is required by norms. This same sort of squandering is allowed at the motor bicycle plant.

Gardens and parks and greenery lined streets play an important role in the struggle against environmental pollution.

The citizens of Minsk consider the planting of greenery and the improvement of urban and outlying areas as a day to day goal directed project towards improving the conditions of labor, life and recreation, and towards creating a pleasant image for the republic's capital.

Control and supervision over the implementation of their decisions and the decrees of higher organs is a very important facet of the activities of local soviets and their permanent commissions for the conservation of nature. We strictly supervise every decision and deputies are informed of its implementation at regular meetings. Last year the problem of conservation was examined at the meeting of the ispolkom of the Zavodskiy Rayon Soviet. It was noted that enterprises in the rayon have completely curtailed the emission of untreated waste waters into open reservoirs. However, in their

---

speeches, deputies indicated that at some production operations there is still a high degree of dust and gas and ventilation equipment is not always in good condition. Managers of these enterprises were ordered to rapidly straighten up the situation. At the subsequent meeting of the ispolkom, the deputies were informed about what had been done.

Obviously, we would not have achieved such significant successes if we had not attracted a large group of active individuals into this work and not established close ties with societies for the conservation of nature. To a great extent the attitudes towards nature are a good indicator of the social maturity and conscientiousness of each member of society. Only those who have a feeling for its beauty and unsurpassable value can protect nature. It is one of the most important tasks of local soviets and the duty and obligation of each deputy to give people a feeling of high responsibility for the intelligent use and reproduction of nature's rich resources and to do away with a consumer attitude towards these resources.

11,574  
CSO:5000

## LAGS IN IMPLEMENTING AIR POLLUTION CONTROLS

Moscow EKONOMICHESKAYA GAZETA in Russian No 20, May 78 p 19

[Article by M. Korf, section member of the Interdepartmental Scientific and Technical Council for Environmental Protection: "The Air and the Automobile"]

[Text] A wide complex of measures is being realized in Moscow on the revivification of the air environment. One of the major directions in this work is decreasing the toxicity of automotive exhaust fumes.

Many ministries, departments and scientific organizations have been enlisted in the solution of this problem. Heading this work is the section on the protection of atmospheric air from motor vehicle pollution of the Interdepartmental Scientific and Technical Council for Environmental Protection of the Moscow Municipal Executive Committee.

Much has already been done. The Central Scientific Research and Design Technology Engine Toxicity Laboratory [TsNILTD] of the Ministry of Agricultural Machine Building has developed the design of catalytic neutralizers, devices to neutralize harmful substances contained in motor vehicle exhaust fumes. Last year 90 trucks of the Main Administration of Automobile Transportation of the Moscow Municipal Executive Committee were outfitted with them. Tests revealed that the neutralizers were highly effective and reliable in operation.

The Central Scientific Research Institute of Automobiles and Automotive Engines [NAMI] of the Ministry of the Automotive Industry has developed designs for low-toxicity carburetors. They are produced at the Dmitrovgradskiy auto assembly plant and in the near future such carburetors will be produced at the Leningrad carburetor plant. The institute is also developing various engine designs with low toxicity. Widespread introduction of these and other devices to lower toxicity will allow for substantially reducing exhaust fume pollution of the air.

At present our country has an All-Union State Standard [GOST] that establishes the norm for the percentage of carbon monoxide in automotive exhaust fumes. The Scientific Research Institute for Motor Vehicle Transport of the RSFSR Ministry of Motor Vehicle Transportation has developed a new, more rigid GOST.

---

It will go into operation this year. Special standards have also been developed to curtail the exhausting of harmful substances by diesel and gasoline engines.

At almost all major automotive facilities in the city posts to regulate and control automotive toxicity have been established. The light motor vehicle transportation organization in Moscow, Mosavtolegtrans, has done much to equip motor vehicle facilities with diagnostic equipment and gas analyzers. All taxi fleets and automotive combines are equipped with test stands to perform diagnostic and tune up work. At a majority of the stations of the Moscow automotive servicing association, Mosavtotekhobsluzhivaniye of the Main Administration of Motor Vehicle Transportation in Moscow individual automobiles are regulated for toxicity. The owners of the vehicles are issued special coupons on the content of exhaust carbon monoxide.

Unfortunately, operational control over exhaust toxicity has not been set up everywhere. At a majority of small departmental auto facility posts there is no control. To set up a post at every small auto facility is difficult, of course. I think it is necessary to accelerate the work in extending them.

Control over the toxicity of exhaust fumes might be more effective if corresponding devices were manufactured in large quantities. The Ministry of Instrument Making, unfortunately, has not embarked on mass production of devices to control the content of carbon monoxide in exhaust fumes. Regrettably, instruments to measure the smokiness of diesel engines are not being manufactured.

As late as the third quarter of last year the USSR State Committee for Standards had to comprise a work plan on the establishment and improvement of metrological control guarantees over the condition of the environment and the sources of its contamination. However, there is no program.

Control over the toxicity of automotive exhaust fumes is an important means in the struggle for clean air. All measures that are necessary must be taken so that they are carried out everywhere and are done with great efficiency.

8504  
CSO: 5000

## FAULTY AIR POLLUTION CONTROL EQUIPMENT HINDERS KIEV PROGRAM

Kiev RABOCHAYA GAZETA in Russian 28 Apr 78 p 4

[Article by V. Skripnik, Chairman, atmosphere section, City Society for the Protection of Nature: "Inoperative Catchers"]

[Text] In recent years much has been done to see that the air above Kiev is clean and the sky blue. In fulfilling the decisions about nature conservation made by the party and government, ministries have been ordered to improve the air. Technological processes have been improved. New cleaning installations are being built and existing ones redesigned. For example, at the Bol'shevik plant, a gas scrubber has been installed which will considerably reduce harmful emissions into the atmosphere. Several such installations have been redesigned at enterprises of the Ministry of Power Engineering. A total of 112 organizational and technical measures for the prevention of air pollution by emissions from industrial enterprises and from the exhaust gases of motor vehicles have been introduced. A total of 116 gas scrubbers have been redesigned and equipped with the newest devices and the operational efficiency of 103 has been improved.

At practically all enterprises in Kiev promising measures have been worked out for the Tenth Five-Year Plan. It is intended to build an automated system for monitoring air pollution in the city and to set up laboratories for the monitoring of scrubber operations at enterprises. Sanitation and protection zones will be created for all plants and factories. Not a single piece of equipment putting harmful emissions into the atmosphere will go into operation without the necessary pollution control equipment. The state has allocated extensive resources for these purposes.

The efforts of the city organization of the Society for the Protection of Nature are directed toward the protection of the air over Kiev. Nature lovers, together with state inspectorates, sanitation epidemiological stations, motor vehicle inspectorates and the hydrometeorological observatory are checking out dust and gas removing installations operations at enterprises and are analyzing air. At a number of plants and factories, public posts and groups have been set up which daily inspect the work of pollution control installations and atmospheric conditions. The managers of the various enterprises give reports to the office of the party gorkom and council of the society.

All the same, it is still too early to take rest on our laurels. In such regions of the city as the left bank, the Darnitskiy area, the zone around the railroad station and the belt along the Brest-Litovsk Prospect, there are still dust and gases in the air. The TETS-4 and TETS-5, the Bol'shevik and Ukrabel' plants, the machine tool plant imeni Gor'kiy, and the Glavkievgorstroy [Main Kiev Urban Construction] cement and asphalt plants are the sources of air pollution.

What is happening? The state is sparing no money to equip enterprises with modern dust and gas removal installations and is buying the necessary equipment. According to report data all the installations are operating. Why then is the air polluted? The answer, it turns out, is quite simple. As inspections have shown, because of the carelessness of the engineering service at the Bol'shevik plant, for example, half of the gas scrubbers are not operating; at the TETS association, 45 percent of the installations are down; at the machine tool building plant the figure is 33 percent; and at Glavkievgorstroy, 25 percent of the control installations do not work. The gas scrubbers at the Krasniy Ekskavator and the motorcycle plant are only periodically working. The reason is the use of faulty equipment, violations of norms for replacing obsolete assemblies, the lack of a repair base and laboratories at enterprises to monitor the operation of scrubbers. As one can see, this all leads to substantial air pollution in the city.

It is obvious that the time for talk has passed. It is now time for the gorispolkom to seriously question managers of enterprises which do not desire to meet the requirements of society or nature conservation laws.

The air above Kiev should be clean and clear, and the sky blue and bright.

11,574  
CSO: 5000

POLLUTION CAUSES FISHERY PROBLEMS IN KRASNOYARSKIY KRAY

Moscow PRAVDA in Russian 14 Apr 78 p 3

[Article by N. Utkin: PRAVDA Correspondent: "Why Cannot One Catch Fish?"]

[Text] "The discussion is about fish. The Yenisey basin has long been praised for having an abundance of them. Why then does one more and more frequently hear: 'You won't catch any here.' It is true, there are not any. Many rivers in Krasnoyarskiy Kray are used for floating timber, including loose logs. These logs do not only physically disturb the spawning areas, but in addition, 50 to 70 percent of the eggs and hatched out young fish die from waste products in the water.

"Take, for example, the Mana River. The stream is filled up with sinker logs. Beginning in the spring it is completely covered by a transverse log boom which blocks the way to the spawning grounds. The introduction of the Krasnoyarskaya GES into operation made this spawning ground the only one for fish in the upper regions of the river. The situation on the Kaseyeva River is similar. Earlier, when few logs were rafted, one could catch 200-250 centners of fish in 5-10 days. Now this river has lost its economic significance as a fishery.

"In violation of the law, the Oya River is blocked off during the fish spawning season. An eight kilometer mile long log jam on the Poyma River near the village of Nizhniy Ingash has still not been cleared. The Nizhneingashles [Nizhney Ingash Forestry] Association twice, in 1976 and 1977, was ordered to clear it. The association was fined about 3,000 rubles to compensate for damages caused to the fishery. However, nothing has changed. The efficiency of these measures and sanctions is low because the association does not pay from its own pocket, but from that of the state. The Krasnoyarsklesprom [Krasnoyarsk

Forestry Industry] All-Union Association has in reality made no response to our request to take action against those who pollute bodies of water. The plan for raising sunken logs and collecting damaged timber is not fulfilled year after year."

(From a letter by G. Silachev, deputy chief of the Yeniseyrybvod [Yenisey Fisheries] Administration, and A. Samusenko, inspector for the protection of bodies of water from pollution.)

These instances of an indifferent attitude towards fish stocks and their reproduction cited in this letter from Krasnoyarsk cannot help but cause concern. What is more, PRAVDA has already written about similar cases ("Do Not Neglect the Rivers" - 14 Feb 1976, and "'Living Silver' of the Yenesiy" - 16 Dec 1976). The first article resulted in extensive but foggy answers from the appropriate departments. They completely discounted the urgency and importance of the problems raised. The second was only answered by USSR Minenergo [Ministry of Power Engineering and Electrification]. The USSR Ministry of the Timber and Wood Processing Industry simply said nothing. The criticism and its targets were serious and specific. In particular, it was pointed out that the use of half ton drag chains on log floats plows up the river bottom and disturbs the gravel beds where species of fish spawn. These chains also destroy valuable fish eggs. They should be replaced by metal pontoons. So far, nothing has changed.

The reasons are the same, the lack of desire to solve the problems. This is why there are still no pontoons. For example, take a look at this fact. As can be seen in the letter from the Yeniseyrybvod workers, the Krasnoyarsklesprom Association chronically does not fulfill the plan for raising sunken logs and collecting damaged timber. The mechanization of these labor intensive processes is not being vigorously introduced. The two pieces of equipment available for these purposes were not used during the 1977 navigation season. The cranes were dismantled and the pontoons were used to haul hay ...

The USSR Ministry of the Timber and Wood Processing Industry should have answered these questions and, most importantly, taken measures which would assist in the conservation and growth of fish stocks in Siberia and other regions in the nation.

As was stated above, USSR Minenergo responded to the criticism. However, one can hardly agree with its assertion that: "...during the time of operation of the Krasnoyarskaya GES there have been no noted cases of fish entering the turbine intakes and being killed," and therefore, it is not necessary to construct fish protection devices or to install special equipment on dam spillways. However, Yeniseyrybvod has come to the opposite conclusion, for it is known that there have been a considerable number of fish kills at the Krasnoyarskaya and Ust'-Khantayskaya hydroelectric sta-

tions. To see this and not acknowledge it is just like calling black "white."

The Decree of the CPSU Central Committee, approving the experience of fisheries resources management in local bodies of water in Tyumenskaya Oblast', presented the task of more completely meeting the Soviet peoples' requirements for high quality food products. The fame of the wonderful rivers and lakes in Tyumenskaya Oblast' and all over Siberia should not and must not be allowed to disappear. It is necessary to obtain the joint efforts of all ministries and departments in any way connected with the exploitation of the mighty rivers in this region.

11,574  
CSO: 5000

CONFERENCE: POWER MINISTRY VS. ENVIRONMENT

Moscow IZVESTIYA in Russian 13 May 78 pp 1, 3

[Article: "Preserve Our Nature"]

[Text] A joint meeting of the permanent commissions for environmental protection of the houses of the USSR Supreme Soviet took place 11 May in the Kremlin; the meeting examined the question of "Observance of the Legislative Requirements for Environmental Protection by the Enterprises of the USSR Ministry of Energetics and Electrification."

Today the deputy members of the joint preparatory commission tell about the work that preceded the meeting and how the discussion went.

S. I. Ibraimov, first secretary of the Osh obkom of the Kirghiz Communist Party: In the 67th article of the new USSR Constitution it is written: "Citizens of the USSR are obliged to preserve nature and to protect its resources." Our Party and state have always centered and are centering attention on questions of environmental protection, and the rational use of natural resources. Since 1974 the annual and long-term plans for the development of the national economy have included a special section on environmental protection. Appearing before the 25th CPSU Congress Comrade L. I. Brezhnev stressed: "...nature can be used in different ways. One can--and the history of mankind knows many examples of this--leave behind barren and lifeless spaces hostile to man. But one can and should, comrades, enrich nature, and help nature more fully reveal its life forces. There is such a simple expression known to all 'blossoming land.' This is the name for the lands where knowledge, people's experience, their affection and their love for nature truly have worked miracles. This is our socialist way."

Yes, the 20th century, the century of the vigorous growth of industry, has placed before mankind the problem of an intelligent combination of the transformation and protection of nature. In our country many standardized acts have been directed towards protection of nature and its resources. Only in recent years the USSR Supreme Soviet has adopted the Fundamentals for land

legislation of the USSR and the union republics, of water and forest legislation, and of legislation on mineral resources. The highest organ of state power in the country is constantly controlling the fulfillment by the ministries and departments of these laws. The conversation at today's joint meeting of the permanent commissions of the houses for environmental protection was also conducted in terms of such control.

V. I. Semenov, chairman of the ispolkom of the Gor'kovskaya oblast Soviet of People's Deputies: Why did the commissions decide to listen to the USSR Ministry of Energetics and Electrification? Enterprises of this branch have important influence on the state of the environment. It is sufficient to say that they use for their needs more than half of the total amount of water consumed by industry and the public utilities in the country. Great also is the discharge into the atmosphere of combustion products from power engineering fuel at the power plants and central heating plants.

In the period preceding the meeting we did a lot of preparatory work. Many ministries and departments sent their materials to the commission. Locally, in the republics and oblasts, the deputies became familiar with what environmental protection measures are being taken by the enterprises of the USSR Ministry of Energy, and according to the results of the checks they presented the appropriate information to the permanent commissions.

Analysis of all these materials indicated that in recent years the ministry had done specific work to improve the use of natural resources and to protect the environment from pollution. In the system of the ministry a section has been formed for environmental protection, a specialized enterprise has been created "Energogazochistka," and the "Regulations for Technical Operation of Gas-Purifying and Dust Collecting Units" have been approved.

As noted at the meeting, as a result of the measures taken in the Ninth Five-Year Plan and in the first two years of the Tenth Five-Year Plan the air basin has become considerably cleaner in the largest industrial centers of the country, as well as the water basins of the Black, Azov, and Baltic Seas, and the Volga, Ural and Tomi Rivers. All the power plants built during the last two Five-Year Plans have been equipped with new systems for purifying production wastes. In the Tenth Five-Year Plan state capital investments totalling over 650 million rubles are specified for environmental protection and the rational use of natural resources in the USSR Ministry of Energy.

V. Z. Talybov, electrician in the section of the trust "Azpromelektromontazh" of the Nakhichevan ASSR: A lot has been done. Nevertheless the deputy preparatory commission thought it necessary to note that many enterprises of the branch still pollute the air basin and the water bodies. According to the data of the State Committee of Hydrometeorology and Control of the Natural Environment of the USSR discharges of harmful substances into the atmosphere from these enterprises comprise about a quarter of all the discharges of harmful substances throughout the country.

V. N. Ptitsyn, first secretary of the Murmansk CPSU obkom: The deputies and specialists who spoke at the meeting noted that at many enterprises the ministries hitherto have not created specialized services for the operation, repair and adjustment of the gas-purifying units. This refers, in particular, to such major plants as the Dobrotvor and Karaganda GRES, and the Irkutsk, Kostroma, and Vologda TETs. The USSR Ministry of Chemical and Oil Machine Construction also deserves reproof because it supplies ash trapping equipment that sometimes does not meet the present day requirements for efficiency and reliability.

L. A. Borodin, first secretary of Astrakhan CPSU obkom: A lot of attention was focused by the participants of the meeting on the attitude of the enterprises of the Ministry of Energy to the country's water resources. It was found that contrary to the requirements of the environmental protection legislation the ministry in a number of cases permits the putting into operation of new production plants without the necessary complex of water treatment facilities. This happened, in particular, at the Fergana and Khabarovsk TETs.

It is necessary to say that when the deputies became acquainted with the situation locally they were in close contact with all the services in some way or other associated with environmental protection. For example, deputy V. I. Semenov conducted an examination with the participation of the chief state public health doctor, the head of the oblast regional inspection of gas purification, the chief engineer of the Verkhne-Volzhskiy territorial administration for regulating the use and protection of waters, the manager of municipal energy, and the head of the section for environmental protection and forestry of the oblast plan.

L. N. Atanovskiy, first secretary of the Kriulyany raykom of the Moldavian Communist Party: In becoming acquainted with the work of the enterprises of the Ministry of Energy in Moldavia we focused attention on the fact that at a number of power plants that are polluting the reservoirs with waste waters the construction of water treatment facilities is going very slowly. Already here in Moscow, by comparing our conclusions with the notes of other deputies and the materials presented by the ministries, we found that according to the data of the Ministry of Energy itself the plan for the putting into operation of treatment facilities in 1977 has not been fulfilled.

Ye. K. Kharadze, president of the Academy of Sciences of the Georgian SSR: The Fundamentals for water legislation in the USSR and the union republics, and other standardized acts have established that with the arrangement, designing, construction and putting into operation of new and renovated enterprises at the fishery reservoirs the measures for protecting the fish, and other aquatic plants and animals must be opportunely implemented. However these requirements in a number of cases have not been observed by the enterprises of the Ministry of Energy. I can judge this in the example of the Inguri GES which we are building. Construction of the power plant must be compensated for by building of fish plants. Alas, the power engineering construction is far in advance of the fishery building.

Ye. S. Rychin: first deputy chairman of the ispolkom of the Moskovskaya oblast Soviet of People's Deputies: It was stressed at the meeting that many enterprises of the USSR Ministry of Energy are also violating the legislative requirements for a cautious attitude towards the land. The ministry does not take into account in full measure the losses of agricultural production in the construction of hydroelectric power plants. The estimate for the construction of new GES generally does not include means for removing from the flooding zones of the rich soil layer for its use for recultivation or improving the fertility of low-productive lands. These resources were not included in the estimate for the Dnistrovsk, Cheboksary, Nizhne-Kamsk, and other GES under construction.

Questions on the recovery of ash and slags at the thermal power plants are being answered slowly. From year to year the areas increase which are occupied by ash and slag heaps. In the Ukraine these areas comprise over 3000 hectares, and in the RSFSR--over 10,000.

Ye. P. Moskalenko, pro-rector of the Rostov Medical Institute: In the Rostovskaya oblast hundreds of hectares of the richest Don chernozem are occupied by ash and slag heaps. At the same time it must be said that in the Novocherkassk Polytechnical and the Rostov Engineering-Construction Institutes there are completed research works on the comprehensive use of ash and slag. The heaps can be used as fillers for concrete and solutions, for the mass production of precast reinforced concrete structural parts, in the production of brick, ceramics, mineral wool, and so forth.

B. Atayev, first secretary of Tashauz obkom of Turkmenistan Communist Party: In the resolution adopted at the meeting by the commissions for environmental protection of the Soviet of the Union, and Soviet of Nationalities of the USSR Supreme Soviet specific recommendations were given to the USSR Ministry of Energetics and Electrification, recommendations whose fulfillment is directed towards fuller observance of the legislative requirements for environmental protection at the enterprises of the branch. Recommendations were also addressed to the USSR Ministry of Chemical and Oil Machine Construction, the USSR Ministry of Power Engineering Machine Construction, the USSR Gosplan and the USSR Gosstroy, and a number of other union ministries and departments. The commissions are controlling the execution of these recommendations.

The meeting was led by the chairman of the commission for environmental protection of the Soviet of Nationalities D. M. Gridasov.

At the meeting reports were given by the leader of the joint deputy preparatory commission S. I. Ibraimov, and First Deputy Minister of energetics and electrification of the USSR Ye. I. Borisov. The following deputies participated in the discussion: A. P. Bezdetko, L. A. Borodin, Ye. P. Moskalenko, V. I. Semenov, Ye. K. Kharadze, Chairman of the State Committee on Hydrometeorology and Control of the Environment of the USSR Yu. A. Israel', and leaders of a number of other ministries and departments of the USSR.

The following participated in the meeting: Deputy Chairman of the Presidium of the USSR Supreme Soviet A. S. Barkauskas, and Chairman of the Soviet of the Union of the USSR Supreme Soviet A. P. Shitikov.

USSR

## LIFE RETURNING TO NORMAL AFTER TADZHIKISTAN HURRICANE

Moscow PRAVDA in Russian 29 May 78 p 3 LD

[Report by Correspondent O. Latifi: "In Defiance of the Elements"]

[Text] Leninabad-Dushanbe--All around there was cause for joy. Horticulturists were gathering cherries and apricots which had ripened beneath the generous southern sun. Shepherds were leading sheep and lambs along narrow mountain paths to the summer pastures. Hay mowers were chirring on the hills.... And no one noticed the black stormclouds emerging from behind the mountain peaks.

The hurricane began suddenly. The wind broke off tree branches. Turbid streams rushed along after it, sweeping aside everything in their path. The telephone rang in the office of Muminov, secretary of the party committee of the Lenin Kolkhoz on Proletarskiy rayon. A minute later he was in his car. The gazik rushed through the central complex with its siren blaring.

"Follow me," Muminov shouted to tractor drivers on the way. When we drove into the village of Yangikhayet, a mudflow was already seething in its streets, but there was no one in the houses: young and old were struggling against the elements.

A high wave swept along the irrigation canal, but the spillways were already open in its path. A. Samatov, chairman of the board, had seen to this. He quickly organized posts at all the hydroengineering installations. The mudflow was tamed in time and directed along a safe channel. The hurricane died down, but the rain dragged on. The amount of precipitation in 24 hours was twice the monthly norm. Snow fell in the mountains. In the very south of Tadzhikistan, where there was no rain, there were sandstorms. Sand dunes were formed in some fields.

"People countered the elements with courage and a high degree of organization," M. Babayev, secretary of the Tadzhikistan CP central committee, said. "As soon as the hurricane started raging, an operations headquarters was set up in Dushanbe."

Now it is sunny again in the streets. But the struggle against the aftermath of the elements is continuing. The cotton crops, particularly fine-fibered cotton, are in jeopardy. The solid crust which has formed on the soil after the rain could kill the plants. A shock watch has been announced in the republic. It is essential to hoe the soil in 2-3 days in all areas. All available equipment has gone into the fields, and round-the-clock work has been organized.

The disrupted work rhythm is gradually getting back to normal. Trucks loaded with ripe cherries and apricots stretch toward the airports. The cotton plantations are gay with girls' colorful headscarves. Hay mowers have begun working again on the slopes. Farmers are even endeavoring to make use of the bad weather. The surplus of moisture which has been created has had a beneficial effect on the growth of grasses and fodder crops. The working people of Ura-Tyubinskiy rayon have launched an initiative--to procure twice the planned quantity of coarse fodder this year and create a sound livestock-raising base.

The water in the rivers is abating, but the roads have not yet been restored everywhere. Reluctantly, as it were, the mercury in the thermometer is surmounting one mark after another: 18-20, 25-30 degrees. The elements have not broken the people.

CSO: 5000

INTERNATIONAL AFFAIRS

DANISH-SWEDISH STRAITS POLLUTED BY SWEDISH CHEMICAL DUMPING

Copenhagen BERLINGSKE TIDENDE in Danish 13 Apr 78 p 1

[Article by Peter Kjelstrup]

[Text] Over a period of years the Swedish firm Alufluor AB in Helsingborg has dumped several hundred tons of pure fluorine and aluminum fluoride into the Øresund. So said the firm's former director, Karl E. Sellergren, after the plant had shut down temporarily as a result of pollution problems within the plant itself.

The dumping took place at the same time that the firm's parent corporation, Boliden Kemi AB, Helsingborg, was sending in reports of much lower amounts of wastes week by week to the district [län] administration. Karl Sellergren says that Alufluor regularly reported the actual amount of the dumping to Boliden.

In November, when the dumping was no longer taking place, Boliden itself reported to the district administration that the dumpings had taken place. At that time the immediate closing of the plant, which would otherwise have resulted from the dumpings, was no longer in question.

In all, the firm discharged 671 tons of pure fluorine and 175 tons of aluminum fluoride. This took place during 1976 and 1977. During that time the firm had permission to discharge 40 tons of fluorine and 21 tons of aluminum fluoride.

The plant has been temporarily closed for a month as a result of an asthma-like condition among the workers. Yesterday the management issued a statement on what the firm would do about the matter.

8815  
CSO; 5000

---

CYPRUS

ENVIRONMENTAL COMMITTEE HOLDS CONFERENCE IN LIMASSOL

Nicosia KHARAVGI in Greek 18 Apr 78 p 5

[Text] Limassol, 17 April--The government must promptly deal with the problems associated with the preservation of our natural environment.

This warning is contained in an appeal to the government issued by the first Congress For a Natural Environment, which was held yesterday in the municipal building of our city on the initiative of the Committee For a Natural Environment [EFP] and the Limassol Mountaineering Club.

Presiding over the activities of the congress, in which 140 representatives participated, was Deputy Giangos Potamitis, while the president of the EFP, Giannakis Potamitis, gave an introductory speech, on the theme: "The Environmental Crisis." Taking the floor after him was I. Khatzivasilis, chemical engineer, who spoke on the theme "Contamination of the Atmosphere and Pollution of the Sea," and the architect, Mrs Kristia Khristou, who spoke on the subject "Natural Environment and Town Planning."

Various congress participants strongly condemned the plans being made with respect to Dasoudi, the ruining and the closure of the Limassol beach, and thoughtless town-planning developing, together with its consequences, and meanwhile all the other problems relating to the environment of Limassol were given their due attention and discussion.

The congress approved a resolution expressing support for the president of the Republic and an appeal to the president and the government to immediately deal with the problems of the natural environment which are arising, suggesting as a first step the formation of a ministry for the protection and preservation of the natural environment, suitably staffed with scientific and other personnel.

Finally, for the purpose of promoting the goals of the congress, a 25-member administrative council was elected.

Present at this congress was Mayor F. Kolakidis, the director of the department of fishing, Mr Dimitropoulos, and representatives of various parties, associations, and organizations--including AKEL, the EKA, the POED [Pan-Cyprian Greek Teachers Organization], the Federation of Parents of Elementary and Secondary School Children, the Cypro-Soviet Association of Limassol, the Coordinating Committee of Student Councils, and others.

12114  
CSO: 5000

---

WEST GERMANY

FISH REPORTED DYING OUT IN ELBE RIVER

Frankfurt/Main FRANKFURTER RUNDSCHAU in German 13 May 78 p 3

[Text] The fisheries motorship "Julius Fock" returned from the Antarctic to the harbor of Hamburg in the past few days with 300 tons of fish and krill on board. As it came it was sure to attract the greatest attention, for krill, until recently mainly a food for whales on the verge of extinction, is in the meantime in everybody's mouth here: it is soon to appear on the table as soup, bread spread, or stew.

During the trip up the Elbe there occurred an encounter perhaps of historic symbolic value. Perhaps the "Julius Fock," which was accompanied on its voyage by the research ship "Walter Herwig," met one of the last Elbe fishing boats. It would have been a great coincidence, however, and it is even questionable if either ship would have taken notice of the other at all; for on the lower Elbe there is still a handful of fisheries vessels. No more will be necessary, for while the explorers are tracking down krill at great expense far away, there is a threat that the last species of fish are dying out in the lower Elbe.

In 1925 there were still 12,000 boats of all types tied up there. In 1918 about 10 million kilograms of fish from the lower Elbe alone were landed in the Hamburg fish market. This quantity equals 40 percent of the ocean fish sold in the Hamburg ocean fish market at the present time. In order to gather this quantity today, the ships must undertake 400 to 700 voyages annually to very distant fishing grounds. While these fishermen are under way, the smelts, flounders, eel fry and eels in the lower Elbe have less and less room in which to live.

Sturgeon and salmon have not been caught in the Elbe for a long time. And so it will soon be with the remaining species. This is also the alarming conclusion of a study of the "Fish-Fauna of the Lower and Middle Elbe" between 1960 and 1975, issued by Prof Horst Wilkens and Angela Koehler of the Zoological Institute of the University of Hamburg. In addition, river control construction and the daily deluge of sewage into the river likewise threaten the fish.

In the Hamburg area alone 726,000 cubic meters of sewage, about half of which is unclarified, pour into the Elbe every day. This foul water is supplemented by 3.4 million cubic meters of cooling water. As a consequence the oxygen content of the water declines, and in dry summers there occur massive fish kills. The lower Elbe, according to both scientists, is so especially over-loaded between Hamburg and Glueckstadt on the opposite Lower Saxon shore of the Elbe, that the sewage flow acts like a barrier. The fry and fish migration routes upstream in the Elbe are blocked or seriously encroached.

Scientists pointed out earlier that there is a link between growing water pollution and certain serious diseases among fish. Such diseases have also been confirmed among the Elbe fish. For example, about 6 percent of eel fry landed in Hamburg from 1957 to 1959 were already affected by tumors. In 1971 the number of diseased fish rose to 28 percent.

But the breeding grounds of the smelt are in the southwestern part of the Elbe between Hamburg and Glueckstadt, especially polluted by sewage. The lower Elbe eel fry grow there and the flounder live there. Both require fresh water. The filth drives them further downstream, however. They can no longer develop in large numbers and occur only individually.

But, according to the study of Wilkens and Koehler, sewage is only part of the threat to the fish. River control construction and the diking and straightening of the river undertaken for industrial settlement and against flood tides also play a role. If it had gone according to the wishes of authoritative politicians and planners in Lower Saxony, Schleswig-Holstein, and Hamburg, the Elbe today would be a canal even more closely hemmed in by industry, in which no form of life could any longer exist.

But now something bad has happened again. By the diking off of the Nordkehding marshland, the Kraut and Assel Sand on the Lower Saxony side, the Haseldorf and Wedel marsh on the Schleswig-Holstein side across from Stade and through further straightening above and below Hamburg, the possibility of existence has been taken from fish and other animals. Over a large expanse, tidal flats which lay before the dike, old channels, backwaters and pools have been robbed of their link to the main stream.

The material dredged during the deepening of the navigation channel of the Elbe was dumped on the sands and tidal flats, and led to the loss of breeding and nutritional biotopes of the fish. In the straightened and narrowed river bed, the high waters especially important for the cleansing of the channel and for the fish flow past much too quickly. "It is depressing that this development will continue further, in view of planning projects already approved and to be realized in the future," write Wilkens and Koehler. They fear that in the foreseeable future smelt, Elbe flounder, twaite shad and eels will drop below their population density characteristic for the Elbe and thereby the critical limit of economic fishing possibilities." Even more resistant fish like whitefish or ruff perch will probably not find conditions for life in the lower Elbe if something is not done quickly.

---

While the Baltic fishermen fight for their existence, their profession on the Elbe is dying out almost without a murmur. But the Elbe will be only a beginning if they do not come to their senses. For even the pollution of the North Sea is fast increasing and is already threatening fish stock. The situation is already critical in the German Bight. "You sail to the Antarctic, but you let every thing go to pot at home and on your own doorstep. That cannot be right," says a Hamburg citizen as he reads the news of the arrival of the krill ship.

6108  
CSO: 5000

END